PETROLEUM WEEK

JULY 5, 1957

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TECHNOLOGY DEPT.

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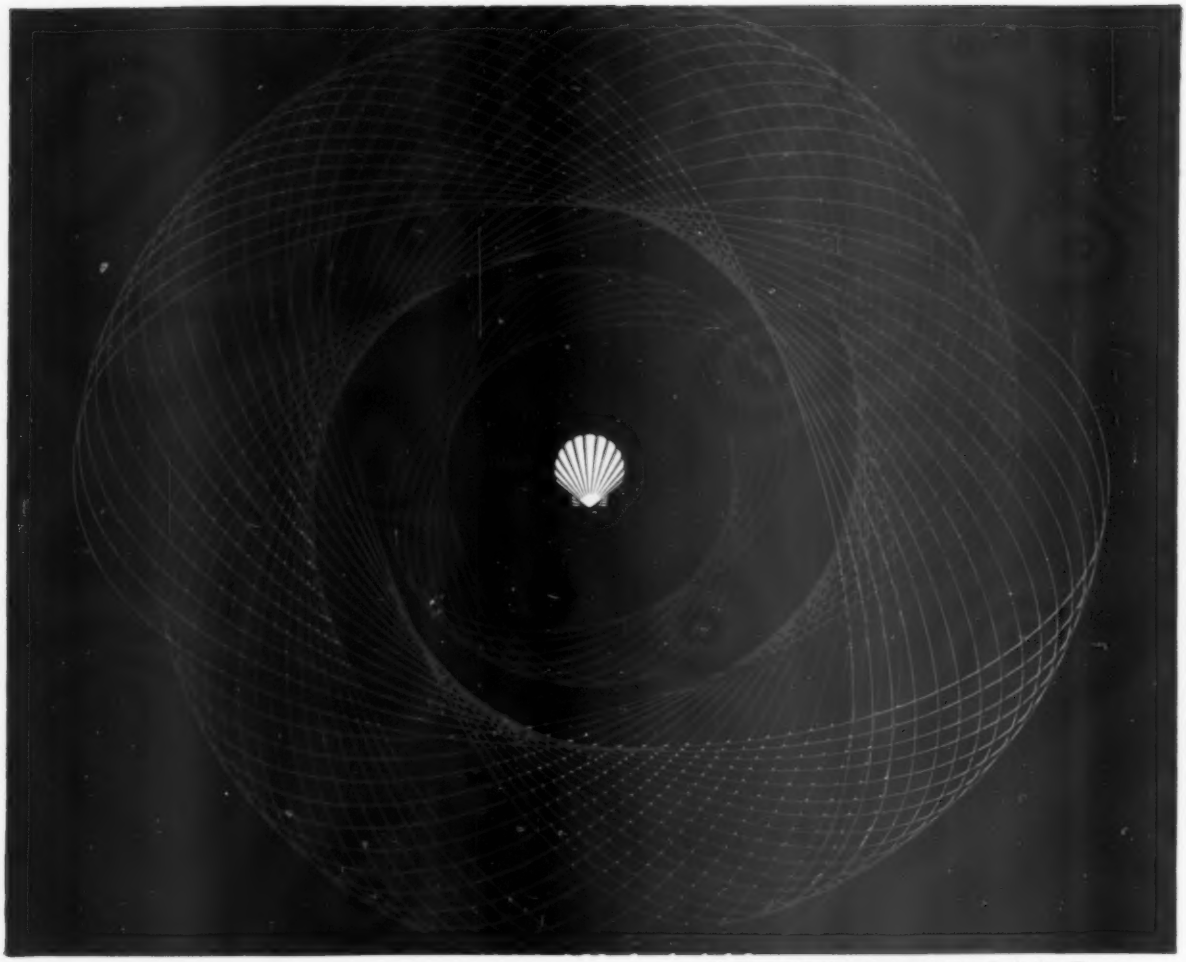

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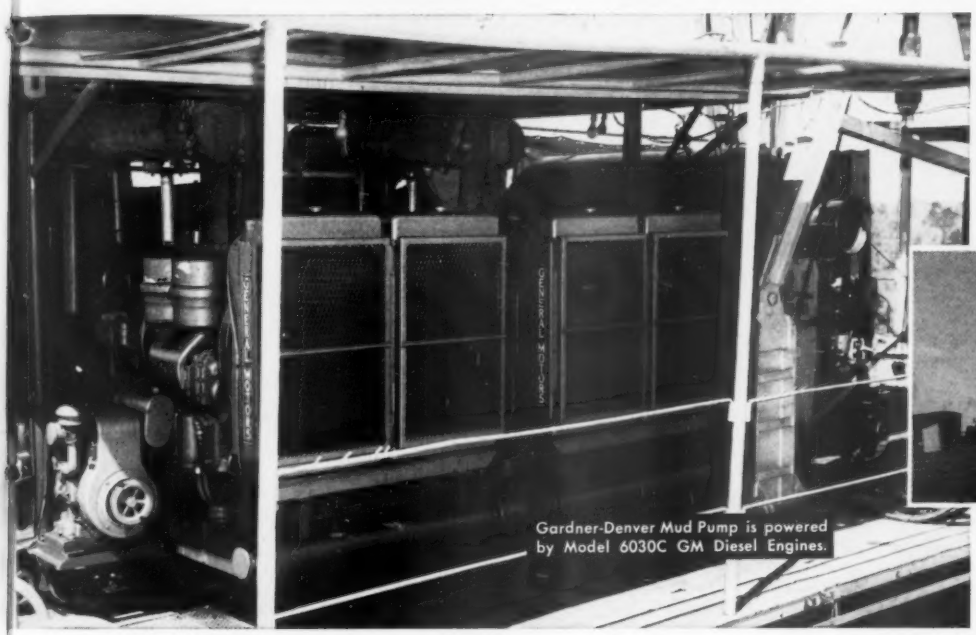
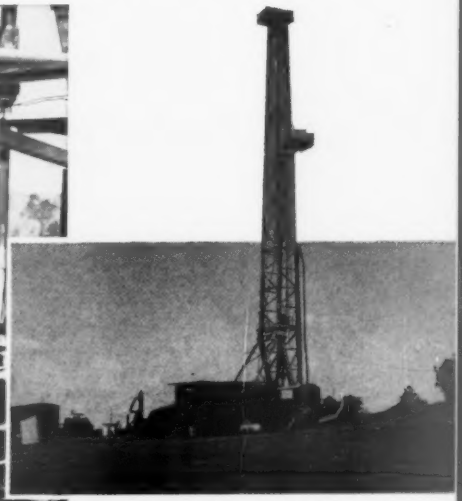


Gardner-Denver Mud Pump is powered by Model 6030C GM Diesel Engines.



South States Drilling Company's Rig No. 1 in the Longview area.

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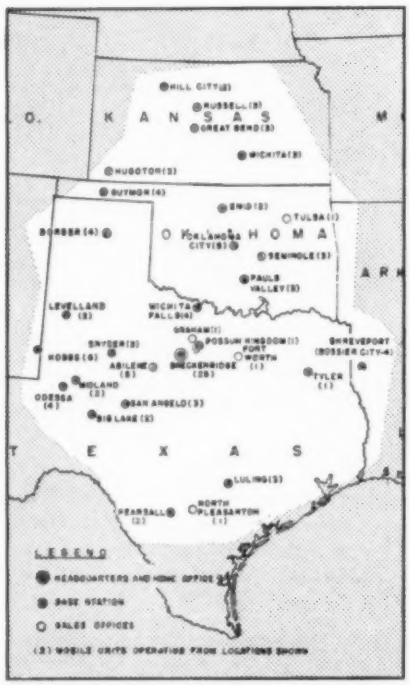

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60-Second Summary / WHAT'S HAPPENING IN OIL

July 5, 1957

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More hurricanes may be battering the Gulf Coast before long. That's the uneasy prediction of some weather experts, who note that hurricanes seem to move in cycles. So, after a breathing spell from 1950 to 1956, the Gulf may be in for stormy weather. . . . **p. 10**

•

Oil-state congressmen are warming up for an import fight in 1958. The reason: They expect the upcoming Cabinet committee study to result in ineffective recommendations. . . . **p. 16**

•

This week's steel price increase brings new pressure for a hike in crude postings. It is the third cost hike—two by steel, one by labor—since the crude price advance in January. But the oil supply imbalance makes a hike now tough. . . . **p. 9**

•

Decision-making based on electronic systems should be commonplace in the oil industry in five years, computer experts say. The brakes of slow communications and lack of skilled manpower will be eased by then, they predict. . . . **p. 31**

•

The world's largest gas injection plant was opened in Venezuela last week. Creole's Tia Juana 2 has more than twice the capacity of its first Lake Maracaibo plant. . . . **p. 35**

•

Texas Eastern is proving the value of bigger compressors and giant gas turbines in its Kosciusko line, soon to be the biggest gas trunk in the company's system. . . . **p. 48**

•

Ammonia absorption refrigeration is being used on a big scale by an Oklahoma natural gasoline plant. The plant processes 50-million cu. ft. of gas daily. . . . **p. 44**

•

Washington may eventually discover that there is growing competition in the oil industry. The Senate antitrust subcommittee staff, making a study of concentration in industry, found that the big oil firms got a thinner percentage of business in 1954 than in 1947. . . . **p. 11**

•

Colorado's first unitized field is getting an unusual waterflood pressure-maintenance program. The project in the Adena field is the first to flood a stratigraphic gascap field of such size. . . . **p. 19**

•

Sinclair is finding that both it and its dealers profit from grassroots sessions on dealer problems. Such meetings—in which dealers are encouraged to speak their mind—spotlight problems. And they create an atmosphere for solving them. . . . **p. 46**

Up to the Minute

SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright ©

July 5, 1957

Prices for some Southwest Texas crudes were adjusted downward this week, ranging from 5¢ to 13¢ a bbl. Such price "penalties" had been expected (PW—May31'57,p14). Atlantic Refining Co. cut 10¢ a bbl. from its postings for Aransas, East Aransas, Corpus Channel, Mustang Island, Red Fish Bay, and Stedman Island crudes. Greta Deep, Refugio types, Hynes Ranch, and Mission crudes were cut 13¢ a bbl. Southern Minerals Corp. cut Refugio types and heavy Mirando crudes by 10¢ a bbl. and East White Point crude by 5¢ a bbl.

In Venezuela, Creole Petroleum Corp. reduced its price for San Joaquin crude by 5¢ a bbl. Cut brings the crude "into conformity with postings by competitors."

On the Gulf Coast, Gulf Oil Corp. raised its posting for segregated low cold test crude in the Orange field by 38¢ a bbl. The increase was made to equalize its price with other low cold test postings.

•

In California, oil firms must now submit all offshore exploration data to the State Lands Commission. The controversial Miller bill, which makes this requirement, has been signed into immediate law by the governor. Its purpose: to help the commission determine terms of leases granted to oil companies.

•

The Harris-O'Hara gas bill is expected to clear the House Commerce Committee next week free of crippling amendments. The bill then must clear the Rules Committee before reaching the floor.

Three proposals aimed at tightening restrictions on producers were killed in committee. The amendments offered would have (1) required the Federal Power Commission to consider cost as a factor in setting field prices, (2) merely permitted FPC to consider cost, and (3) made existing contracts with fixed escalation clauses subject to FPC review.

•

OCAW doesn't like the fact that some recent product price increases have been tied directly to oil wage hikes. In a letter to President Eisenhower this week, the union said the price increases are not justified by labor costs. The union claims that wages haven't even kept up with increased productivity during recent years.

•

British Petroleum Co. is temporarily withdrawing nine tankers from service. The reason: "At the moment, we are longer on tonnage than on demand."

•

Bay Petroleum Corp. is expanding its marketing operations to the Southeast. The Tennessee Gas Transmission Co. subsidiary this week acquired Citizens Oil Co., which has a chain of 75 retail outlets in Alabama, Florida, and Georgia. Bay, with a 23,500 b/d New Orleans refinery, expects to move about 200,000 bbl. a month through the new facilities.

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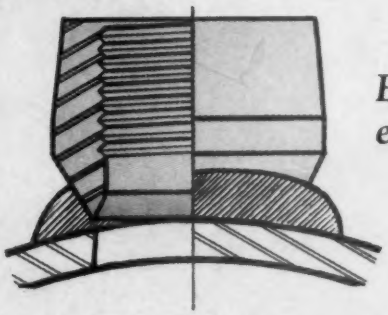

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Steel Is Up; Will Crude Follow?

The advance in steel prices this week—the second in 1957—brings new pressure for an advance in oil prices even in the face of a supply imbalance.

The long expected steel price increase, which became effective July 1, amounted to $6 a ton "on the average." But, as has been the case with most previous price advances by the steel industry, the increases in prices of oil country tubular goods and line pipe were considerably higher than the average.

The advances for the primary steel used by the oil industry ranged from $8 a ton to $15.50 a ton.

Earlier this year—on Feb. 9—prices of oil country tubular goods and some grades of line pipe were increased between $4.50 a ton and $7 a ton.

The higher steel prices came just as oil product prices were advanced by most refiners to offset higher labor costs.

The product price increases, amounting to 0.2¢ a gal. to 0.3¢ a gal., have spread to nearly all sections of the country. The advances, according to the refiners, were made to cover the added costs incurred with the general 6% wage hike.

And now that refiners have related product price increases to costs, there is talk in the industry of relating the higher labor and steel costs to crude oil prices.

Several companies are known to be studying the impact of the latest steel price boost on drilling costs.

But the higher costs have to be weighed against the present ample availability of both domestic and foreign crude and the mounting crude inventories.

Refiners, though, faced a similar position of inventory surplus when they raised product prices.

And, too, the advance in steel prices —made to cover a 6% steel wage boost on July 1—were made in the face of a comparatively soft market for oil country tubular goods.

Oil country steel is not in surplus to the same degree as crude and products. But the sharp decline in drilling activity this year has eliminated the previous "tightness" in steel supply.

Since the last general advance in crude prices, made in January, producers have been hit with a general 6% wage increase and two advances in steel prices.

A leading oil banker—Eugene McElvaney, senior vice-president of the First National Bank in Dallas, said last week—before the steel hike—that present crude prices aren't "sufficiently attractive" to promote an aggressive program of drilling and exploration.

Early last month Robert L. Wood, president of the Independent Petroleum Assn. of America, estimated that the 6% wage boost meant that crude prices should be advanced by 4¢ a bbl. if the higher costs were to be offset .

The two advances in steel prices this year add up to an increase of from 8% to 9% for oil country tubular goods and line pipe.

The advances range from $12.50 a ton for standard buttweld pipe to $22.50 a ton for grade D drill pipe.

The most recent increase was the sharper of the two price boosts made this year.

Small diameter (0.5-in. to 4-in.) weld pipe, which was advanced $4.50 a ton in February, was increased by $8 a ton this week.

Seamless pipe, up to 24-in., which was advanced $6.50 a ton in February, was moved up $8 a ton in July.

Electric weld line pipe (24-in.) and seamless and electric weld line pipe (26-in. to 36-in.) received no price advance in February. In July the prices advanced $8 a ton and $6.50 a ton, respectively.

All sizes of J-55 casing were advanced $6 a ton in February and $9.50 a ton this week. And J-55 tubing was advanced $6.50 a ton in February and $10.25 a ton in July.

The sharpest boosts were made in drill pipe—$7 a ton in February and $15.50 a ton this week—for grade D, internal upset.

The two steel price advances mean that producers will pay a base price of $204.91 a ton for J-55 casing, 7-in., 20-lb., with threading and couplings. The new price for 2-in. J-55 tubing, threading and couplings, is $258.82 a ton. And for grade D drill pipe, the new base price is $279.95 a ton.

Suez Pipeline Talk Revived

A long-discussed proposal for a crude pipeline system paralleling the Suez Canal and controlled by Egypt is back in the news this week.

Cairo radio reported that negotiations were progressing between the Egyptian government and shipowner Aristotle Onassis for building and operating a "twin" pipeline. The proposed system would extend up the east side of the canal from the Gulf of Suez to Port Fued, on the Mediterranean. It would be 103 mi. long.

Two Egyptian agencies—the Egyptian State Economic Organization and the nationalized Suez Canal Authority—would own 51% of the stock in a joint company to be formed, according to a statement of Hassan Ibrahim, chairman of the State Economic Organization.

Onnassis would be the other principal stockholder in the company.

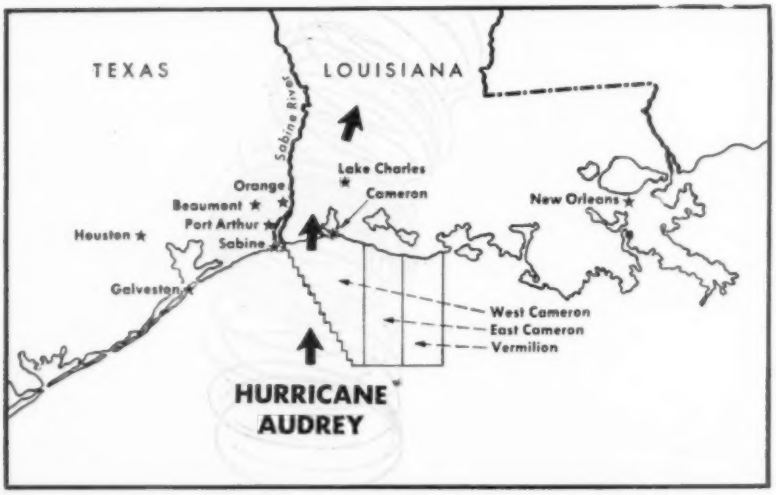
The Egyptian government made similar proposals to Onassis last December, but the shipowner did not like the terms then offered.

Such a proposed pipeline system would permit the Egyptian government to move crude from the largest tankers, now unable to transit the canal fully loaded.

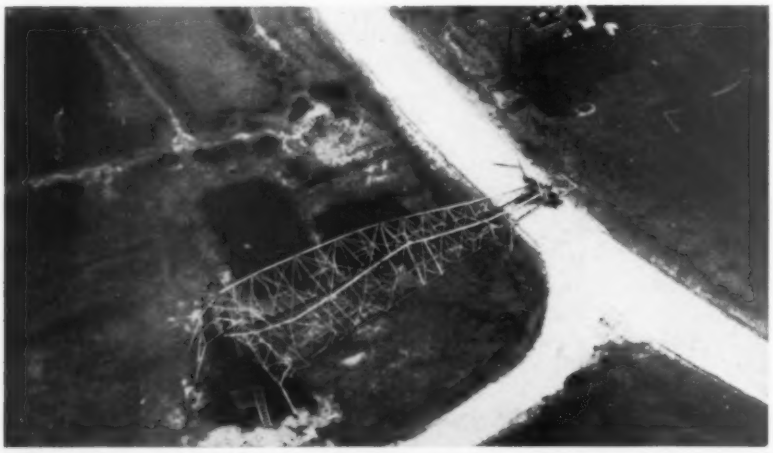
The pipeline project includes construction of port and terminal facilities at both ends of the line to handle the supertankers. Presumably, the projected line would eliminate Egypt's need to widen and deepen the canal for the larger ships, a far more expensive project than the proposed pipeline system.

AUDACIOUS AUDREY did considerable damage to oil installations along the Gulf Coast last week. Examples: A storage tank toppled over (left), and, at hard-hit Cameron, La., a barge shoved inland astride a roadway (right).

Gulf May Face New Hurricane Cycle



SPREADING DESTRUCTION, the hurricane struck hardest in area shown above.



WITH HIGH WINDS, the storm toppled over many derricks, such as this one at a producing well at Hackberry, La., between Lake Charles and Cameron.

Oil men, relieved that the industry fared as well as it did during the heavy pounding of hurricane Audrey, still face a sobering possibility: This may have been only one of a new cycle of Gulf hurricanes.

According to weather forecasters familiar with it, the historic pattern shows a period of five to seven years without Gulf of Mexico hurricanes, then an interval of from six to twelve years with them.

For example, during the past seven years big blows have originated in the Caribbean and have generally moved northward along the Atlantic Coast.

But during the ten-year period from 1940 through 1949, seven hurricanes occurred in the Gulf.

And before that, the Gulf pattern ran like this: 1935-1939, no hurricanes; 1926-1934, five; 1922-1925, none; 1915-1921, eight; 1910-1914, none; 1900-1909, four.

So, although they will make no flat predictions, weathermen fear other storms are soon apt to follow Audrey into the Gulf.

The new cycle—if there is one—is particularly important to oil because of offshore developments since the last series of storms, during the 1940s.

For the most part, offshore oil installations and equipment stood up well under the severe test provided by Audrey. Even so, operators were making posthurricane studies this week to determine how they might better prepare for the next storm.

Preliminary estimates of the total damage to oil installations during last week's hurricane were around $5-million. Final appraisals may push the figure somewhat higher.

A source close to marine insurance

underwriting quarters told PETROLEUM WEEK after a personal tour of the area:

"I don't think the drilling losses are going to be anything like I had thought they would be."

Other first-hand impressions seemed to bear out this view, although accurate damage figures were not available at midweek.

One of the most telling blows fell on the $2-million drilling barge Ed Malloy, owned by John W. Mecom, Houston independent. Wind and wave action caused heavy damage.

The craft is one of drydock-type construction with drilling barge and rig mounted on it.

It was on location about 6 mi. south of Holly Beach, La., in the West Cameron Area, near Cameron, when the full fury of the hurricane struck.

Salvage operations are to begin soon, and, once divers go down, the extent of the damage will be known precisely. The vessel was insured for $1.5-million with Lloyds of London.

Four drilling tenders on location for the CATC Group in the East Cameron Area were set adrift. Three of them finally beached on shore.

Two of the non-self-propelled tenders owned by CATC, the Carl Sharp and the J. C. Craig, and another owned by Reading & Bates Offshore Drilling Co., the Reading, beached in the vicinity of Cameron after drifting between 40 and 50 mi.

Another R & B tender, the Bates, also was set adrift, but remained afloat.

Three of the tenders are already back on location.

A Penrod Drilling Co. drilling barge was cast loose from its Pt. Arthur (Tex.) dock to avoid damage, and was recovered safely.

The craft was brought up the Sabine in advance of the hurricane and docked. But it was decided to evacuate it and cut it loose when gales threatened to batter it against the dock.

Superior Oil Co. reportedly sustained some damage to at least one, possibly more, offshore platforms.

Reports from the area said one of Superior's self-contained drilling platforms was listing and badly damaged, and that there might be two platforms listing.

Onshore damage to plants and field installations was lighter than might have been expected, although the toll was heavy in the Cameron vicinity.

Most of the plants were shut down long before the winds struck. Practically all of them were back in operation within hours after Audrey passed.

Refineries at Lake Charles sustained only minor damage. The big Cities Service plant, built to withstand winds of up to 100 mph., had some sheet steel and aluminium blown off when gusts hit 140 mph.; total damage is estimated at $50,000.

The smaller Continental refinery had two coke silos toppled, and sustained some additional minor damage.

Over in the Pt. Arthur-Beaumont-Orange area, torrential rains flooded the yards of the Gulf Refining Co. and Texaco refineries. But both of these, and the Atlantic Refining Co. installation, reported no damage, however, and were soon back in full operation.

In the field, rigs and wells sustained some damage.

Some of the companies reported rigs blown over, ruptured wellheads and flow lines, and such damage to company property as ripped-off house roofs.

The damage extended to supply houses, service companies, boat operators, tank farms, storage tanks, cars, trucks, boats, and other equipment.

Specifically, as the industry began assessing losses, here were some of the reports:

Shell Oil Co. found its Deeplake field installations had come through in good shape, and there was only minor damage in fields further inland. The company feared there had been some pipe line damage from the effects of the 9-ft. tide that swept in ahead of Audrey.

One of Shell's drilling operations—deepening an existing well in Block 18, East Cameron Area, was interrupted when three LSM breakwaters were lost.

Sohio Oil Co. lost one derrick in the East Holmwood area near Lake Charles, part of a compressor plant at Holmwood, five out of six tank batteries in the Creole area, near Cameron, and its oilfield camp there.

Five wells north of Cameron blew wild in the aftermath of the blow.

A rig drilling for Pan American off McFadden Beach, half way between Galveston and Sabine Pass, shifted. But there was no damage to the equipment. However, it probably will be expensive to put it back on location.

Antitrusters discover:

Oil 'Concentration' Fades

Oil companies, frequently forced to fight off charges of "monopoly," now have some ammunition provided by the inquisitors themselves: data showing that the petroleum industry actually is becoming more competitive.

The staff of the Senate antitrust subcommittee has compiled 756 pages of statistical tables on concentration in various industries.

The study, which has not yet been released to the public, will be billed by its sponsors as the most exhaustive word on industrial behavior since the monographs of the Temporary National Economic Committee in 1941.

Original planning and gathering of the material was under the direction of Jesse J. Friedman, former Commerce Dept. economist, who is no longer with the subcommittee.

The key man now is John Blair, ex-Federal Trade Commission staffer, who was author of the 1952 oil cartel report.

The concentration report shows that, whereas the top four oil companies (unidentified) accounted for 37% of the value of all shipments by petroleum refiners in 1947, the first four companies accounted for only 33% in 1954.

Going further, the first eight companies shipped 59% of refined products in 1947, but only 56% in 1954.

By contrast, the 50 largest companies of all types in the United States accounted for 17% of value added by manufacture in 1947, but seven years later accounted for 23%.

Although the concentration study makes oil look good, the industry can expect to get its share of knocks in the investigation of "administered prices" scheduled to begin July 9.

Chairman Estes Kefauver (D., Tenn.) says the subcommittee will look into industries in which it feels prices are not properly responsive to supply and demand.

Kefauver is expected to try to tie the concentration study into the inquiry, on the ground that concentration and administered prices go hand in hand.

Although the figures plainly show decreasing concentration in oil refining, industry critics may try to gloss this over by hammering on the theme that 55% of the gasoline market, for example, is accounted for by only eight oil companies.

Actually, the subcommittee's own report carefully avoids making any con-

clusions—whether it feels the statistical record is good or bad, or whether it feels any government remedies are in order.

Instead, the document stresses the difficulties of interpreting the raw data, warning that, for some industries, "it may not be significant at all."

The tables follow the Census Bureaus' standard industrial classification system, and are based on information obtained in the Census of Manufacturers.

The big problem is that the Census Bureau classifications were not drawn up for the purpose of making a concentration study, and thus do not necessarily reflect the relevant market in which competition actually takes place.

Critics also note that all information is on a national basis, overlooking the regional nature of some industries.

On the other hand, there is no allowance for imports. If they were counted, the degree of concentration for some industries would be lessened.

Antitrusters hope, however, that the subcommittee study—although imperfect—will ultimately lead to the setting up of continuing concentration statistics to meet antitrusters' specific needs.

Nevertheless, the report does supply the material for just about any kind of attack that critics of big business choose to make. The warnings in small print will be swept aside in the political crossfire.

Manufacturers of oilfield machinery and tools come out only slightly less favorably than oil refiners in the subcommittee study.

In 1947, the four largest such manufacturers took 33% of the business; in 1954, they took 35%.

The first eight companies accounted for 47% of machinery and tool shipments in 1947; for 48% seven years later.

A 1954 breakdown shows that the top four companies accounted for 55% of oil drilling equipment, and for 50% of measuring and dispensing pumps.

The White House is taking a new look at crude imports

Source of Imports	The problem results from the big jump in planned imports for the rest of 1957*	The guide for a new imports formula may be based on the volume in 1956	Exemptions killed the old formula, which was based on imports in 1954
Western Hemisphere	806,000	616,000	405,000
Middle East	371,000	283,000	213,000
Far East	84,000	36,000	38,000
Total	1,261,000	935,000	656,000
Ratio to U.S. crude output	17.4%	13.0%	10.3%

It's quite likely that imports to the West Coast will be exempted. Here are he figures on imports to the rest of the U.S.

Source of Imports	1957*	1956	1954
Western Hemisphere	630,000	511,000	392,000
Middle East	313,000	246,000	204,000
Far East	0	0	1,000
Total	943,000	757,000	597,000
Ratio to U.S. crude output, excluding the West Coast	15.8%	12.2%	11.1%

*Company estimates supplied to ODM. All figures in barrels per day.

The Biggest Imports Problem Is How to Please Everyone

The special Cabinet committee on imports is expected to come up with an early recommendation for the president for a control plan, possibly using 1956 data as a guide.

But regardless of the guide to be used or how it is to be applied, a solution acceptable to all parties will be difficult.

For one thing, Middle East nations will object to the form of limitation that favored Western Hemisphere exporters under the now defunct 1954 formula. As the chart shows, imports from the Western Hemisphere in 1956 gained 52% over 1954, while Middle East imports rose by only 24%.

Too, domestic producers still favor the 10.3% ratio of the 1954 formula—which was later gutted by exemptions.

And most importers want voluntary limitations, leaving the importers a free choice of import origin.

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What's New / IN THE INDUSTRY

Sohio Charges OCAW With Unfair Practices

Standard Oil Co. of Ohio has filed charges of unfair labor practices against the Oil, Chemical & Atomic Workers Union, which represents workers at Sohio's five strikebound plants.

Sohio's charges, filed with the Cleveland regional offices of the National Labor Relations Board, are centered on these points:

- That OCAW is trying to force companywide bargaining by refusing to settle for any one-plant agreement until agreements covering all workers have been reached.
- That OCAW has insisted on changes in contract provisions which the company feels are not open for negotiation under a two-year contract signed last year. That contract, the company says, can be reopened for wages only.

•

Canadians Eye Imports

Canadian producers, too, may begin campaigning for oil import restrictions.

A group of Canadian independent producers has hired Walter J. Levy, a New York oil consultant, to study the Canadian situation.

The producers feel that economics would probably warrant greater use of domestic oil—even if it means building a pipeline from Toronto to Montreal.

They point out that domestic crude is supplying only about 54% of Canada's requirements.

If they can prove the economics of their case, the producers feel they will be in a position to press for imports restrictions.

•

Tax Writeoff Killed

Four Corners Pipe Line Co. isn't going to get a fast tax writeoff on the crude line it plans to build to California.

The Office of Defense Mobilization has refused to issue a writeoff certificate, pointing out that these are now granted only to spur lines and storage plants built to serve military bases.

There is no indication that this will have any affect on the company's plans. Several work contracts have already been let (PW—Jun.14'57, p76).

•

A move is afoot in Nebraska to kill the 1¢ a gal. gasoline tax hike passed this year by the state's legislature.

Nebraska farm and highway-user groups plan to seek a referendum. If they can get about 46,000 signatures on a petition, the effective date of the tax—Sept. 19—would be suspended.

•

Oklahoma ordered no change and Kansas made a 5,000 b/d cut in July allowables. Oklahoma's July allowable will continue at 598,000 b/d, while the new Kansas permissible is 340,000 b/d.

•

An ill wind—hurricane Audrey—may have blown some good for C. G. Glasscock Drilling Co. last week.

The top section of Glasscock's mobile drilling rig, Mr. Gus, was blown almost upright by the storm's force. The rig, sunk last April, had been lying on its side—held by two pilings—since it capsized.

Because the salvage crew would have had to turn the section upright before attempting to lift it, the assist from Audrey was gratefully received.

•

Although Sinclair Oil Corp. has 90% of its investments in the United States, it still feels there is a growing need for oil imports.

P. C. Spencer, Sinclair's president, said this week that "any responsible look at our sharply increasing requirements over the next 5, 10, and 20 years shows that our needs cannot be economically met solely from domestic resources."

He said there should be a balanced program of imports "without rigid restrictions."

COMING SOON
in PETROLEUM WEEK

Corrosion costs the petroleum industry $2-billion a year. It attacks drilling rigs, pipe and casing, pipelines, offshore installations, refineries, storage tanks—every piece of equipment oil men use.

What is the industry doing to curb its ravages?

The answer to this question will be given in a special report on corrosion in the July 19 issue of PETROLEUM WEEK.

The Case of the Well-Traveled Oil Rig

This trailer-mounted rig, owned by Oil Drilling & Exploration, Ltd., is believed to have set a new record recently for this type of equipment. The rig was trucked over approximately 4,000 mi. of Australian roads. That's almost round trip between the East and West Coasts of the United States.

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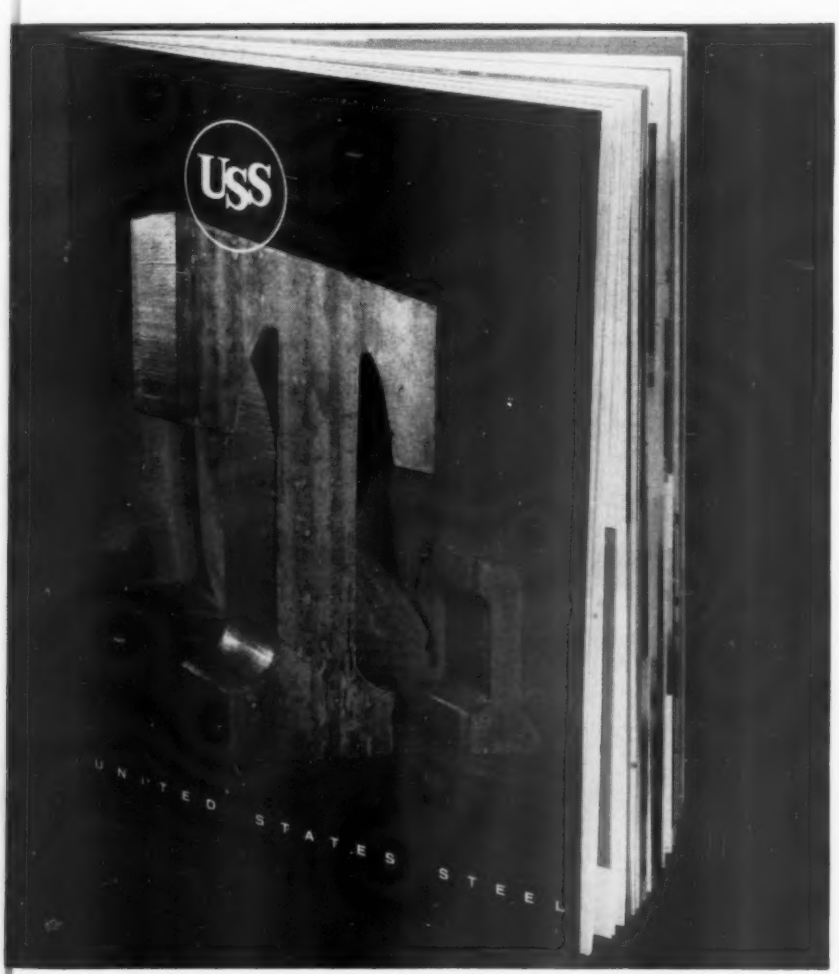

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Looking Ahead in Washington

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July 5, 1957

Oil-state congressmen are cranking up for an imports fight in 1958. They doubt that the new Cabinet level study of the oil imports problem will produce anything more than a meaningless tariff or a new try at voluntary restrictions. If this happens, key men like Sen. Frank Carlson and Rep. Frank Ikard—who sit on committees that write trade legislation—threaten a tough new law curbing imports. They have ready allies in coal-state congressmen, who are incensed because residual fuel oil imports are being ignored in the new study.

The White House is in a ticklish position. Administration policy-makers want to avoid a wide-open trade fight because of the obvious danger to the reciprocal trade program, up for renewal next year. They appear to recognize that something must be done to slow the influx of foreign oil. But they are extremely reluctant to impose mandatory curbs.

The blueprint for the new study encourages importers. They say President Eisenhower's instructions to the group—to "view the national security in its broadest terms," and to take "diplomatic considerations" into account—reflects awareness of their viewpoint. Also, importers like the leading role to be played by Herbert Hoover, Jr.—"consultant" to the Cabinet Committee. Another signal-caller, however, will be incoming Treasury Secretary R. B. Naderson, who is considered more friendly to U.S. producers.

•

Oil shale's pollution potential is worrying government experts. They say one big problem remains to be solved even after processing of oil from shale becomes economically feasible: What to do with the light, cinder-like waste which will pile up at the rate of hundreds of thousands of tons per day. It can be stored in dry canyons, but flash floods would pour it into rivers, raising a serious pollution problem.

•

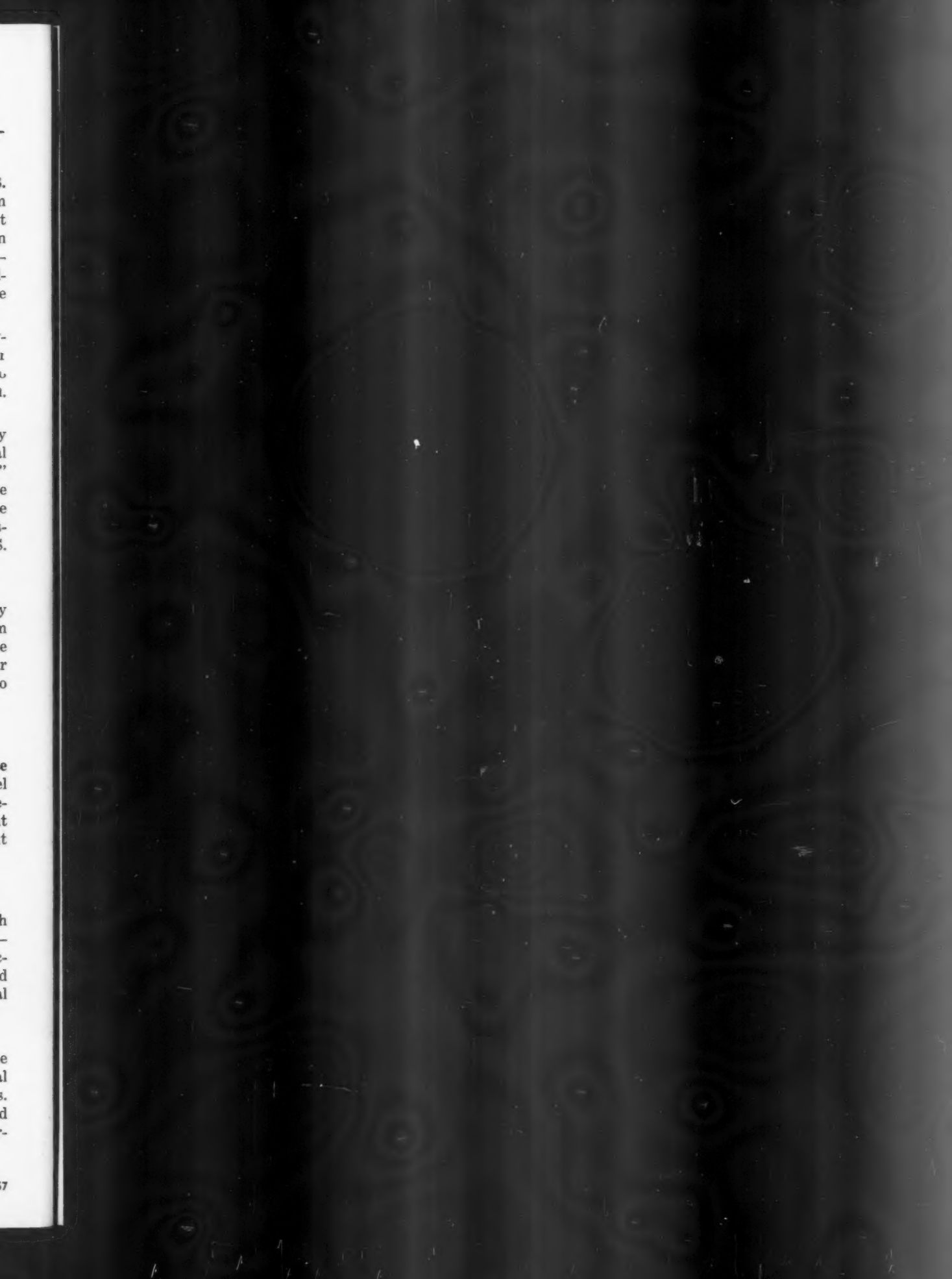
IPAA's Russell Brown defends big-company ownership of oil pipe lines. In a letter to the Senate antitrust subcommittee, the general counsel of the Independent Petroleum Assn. of America says action forcing divorcement of the majors from the pipe line business would hurt independent producers. His reasoning: An independent pipe line would be more reluctant to extend into new or unproved fields.

•

The new lobbying bill is in serious trouble. The proposal, which would broaden the types of activities covered by the lobby law (PW—Jun.21'57,p10), is under heavy fire from the National Assn. of Manufacturers and the U.S. Chamber of Commerce. The bill is unlikely to be voted out of the Senate Government Operations Committee without substantial changes.

•

The civil rights debate will block action on oil-backed bills. If the debate gets under way July 8, as scheduled, it is expected to last several weeks—thereby foreclosing Senate action on other controversial measures. Bills that will go on ice until next year include legislation to open inland waters in Alaska to oil leasing, and to foreclose the military from unauthorized oil development on public lands.



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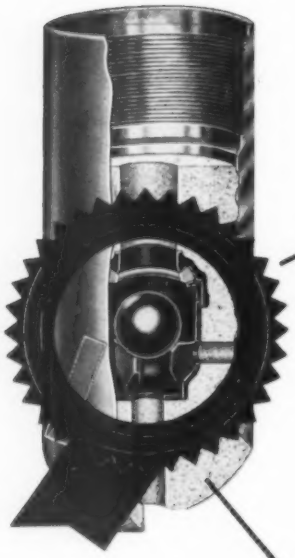

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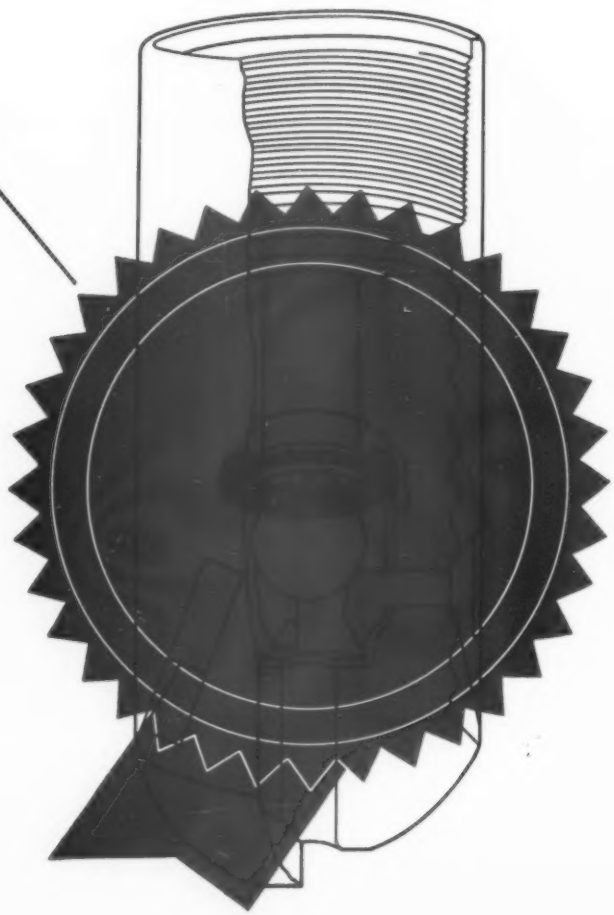

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Unique Waterflood Under Way at Adena

An unusual waterflood pressure maintenance program is moving into high gear at Colorado's Adena field, largest in the Denver-Julesburg Basin and the first ever unitized by the state's conservation commission.

The Adena field is located in townships 1 and 2 north, ranges 57 and 58 west, Morgan County. It has an estimated productive area of about 12,000 acres, of which an estimated 8,300 acres are oil productive.

The program is unusual in that never before has a stratigraphic gas-cap field of such size and relative flatness been flooded at the oil-gas interface.

Contact-zone injection will block the gas cap from migrating to the west, or oil zone, and will prevent oil from being lost in the gas-cap zone.

Viscosity of Adena oil (43.4-gravity) is low, thus leading to the belief that more oil may be recovered by maintaining pressure at a high level by early injection, rather than by waiting to apply true secondary recovery methods after primary depletion is well along.

The expansive effect of the oil-gas-water interface as it moves westward through the reservoir is expected to be very effective in moving oil from the reservoir, according to engineers charged with a study of the field.

A basic aim of the program is to halt the further flow of the gas cap downdip into the oil zone. Continued primary operation would have meant a big loss of oil.

Adena developed with oil production on the west side of the low-relief reservoir. Gas wells were drilled on the east, or high, side of the field.

The gas cap has expanded westward, to some extent, during primary operation, threatening loss of oil into the gas zone and encroachment of the gas in the oil zone.

In its migration so far, the gas cap has left residual oil saturation at 80%. The injection line, therefore, is located behind the zone of migration so that it will flood out the oil remaining.

So Pure Oil Co., as unit operator and in behalf of all parties in the unit, petitioned the Colorado Oil & Gas Conservation Commission for approval of the interface waterflood program.

The flood was approved last February, and injection was started in three wells at the northeastern corner of the field.

In February, 6,964 bbl. of water were injected. This was increased to 43,652 bbl. in March, dropped to 24,433 bbl. in April, and to 16,891 bbl. in May.

During April, 82 wells at Adena were shut in, 58 were flowing, 26 were on artificial lift, and 11 gas wells were shut in.

A total of 22 wells will be used to inject water at the gas-oil contact, sweeping oil westward and downdip in the reservoir, when the $1.6-million flood is in full operation.

Eight of the 22 injection wells had been drilled for oil or gas and were available when the pressure maintenance program was proposed. The others had to be speedily drilled.

Most of the injection wells will be in a northeast-southwest line, along the east edge of the oil producing portion of the field (map).

No gas will be produced until the line drive flood is in full operation and the separation of gas and oil zones fully established.

An injection rate of about 34,500 b/d of water is projected. Pure Oil Co., as unit operator, will seek to maintain reservoir pressure at about 1,205 psi.

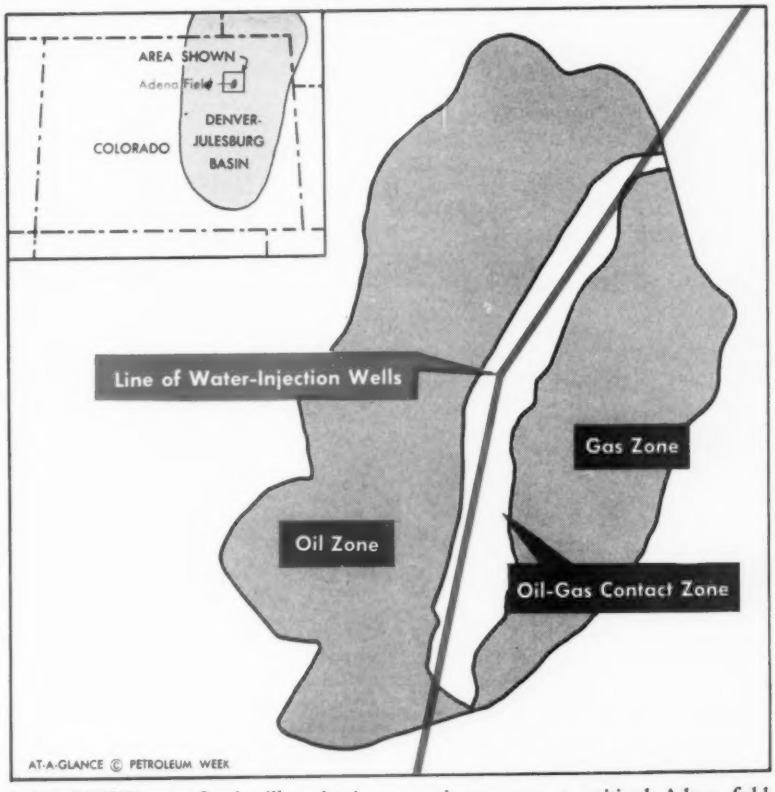
Reservoir pressure originally was 1,541 psi. It declined to 1,467 psi. in August, 1954, about nine months after discovery. By February, 1957, reservoir pressure had declined to 1,205 psi.

It is proposed to maintain pressure at about this level over an injection period of about ten years. At the end of that time, it is believed that injection may be suspended and the field depleted by primary means, allowing a normal drop in reservoir pressure as withdrawal occurs. This will result in a production life of 14.2 years.

Pure says the present allowable of 13,991 b/d is sufficient for now, but the MER (maximum efficient rate) potential may be increased later as full flood operation is reached.

Water will be secured from gravel-bed water wells 70 to 80 ft. deep, on nearby Comanche Ranch Co. properties. Six such ground-water wells on the property have a combined capacity of 255,000 b/d, well above the requirements.

The flood is expected to recover about 27-million bbl. of oil more than



LINE DRIVE waterflood will maintain reservoir pressure at unitized Adena field.

would be recovered by primary production.

Reservoir oil in place is estimated at 183,787,000 bbl. Under primary production, ultimate recovery would total 40,365,000 bbl. Unit operation lifted the recovery estimate to 50,315,000 bbl. Unit operation with water injection is expected to raise the total to 67,519,000 bbl.

Under primary methods, 97,188,000,000 cu. ft. of gas would be recovered. Under unit operation, gas recovery would total 97,675,000,000 cu. ft. of gas. But under waterflood, the total will drop to 68,116,000,000 cu. ft. Productive life, however, will be extended from 13.5 years under primary methods to 22 years under the unitized flood program.

The total gas recovery will be lower under flood operations because an estimated 30% of the gas in the cap is expected to escape downdip and be produced with the oil up to the time the flood water forms a solid front. It's estimated that pressure will build up sufficiently in about two years to permit production of gas from the gas-cap.

Other reservoir factors are: average porosity, 19.7%; connate water saturation, 28.45%; bbl. per acre-ft., 804; average net pay, oil, 20.2 ft.; average net pay, gas, 12.3 ft.

Adena was discovered less than four years ago. Subsequent drilling defined the stratigraphic trap and large gas cap.

The discovery well—drilled by Petroleum, Inc.—found D sand (Cretaceous) oil production. Discovery of J sand (also Cretaceous) production was made by Bill Tomberlin No. 1 Cochran in November, 1953. The J sand discovery was completed for 900 b/d.

The D and J sands are the principal producers of the Dakota series, and have furnished nearly all Denver-Julesburg Basin production. Of the two, the deeper J sand is the more productive at Adena, and in most of the rest of the basin.

Only four wells have been completed in the D sand at Adena. All the others (more than 200) have been completed in the now-unitized J sand. D sand production is not unitized.

The producing formation is about 35 ft. thick, and is found at about 5,700 ft.

The field was unitized Jan. 1, 1956. It is one of the few in the Rockies that doesn't include federal lands.

Adena is in flat farm and ranch country, where most ownership is in fee, and state and federal lands are in the minority.

Unitized operation was considered especially suitable at Adena because of the rather long list of operators in the field, as well as the reservoir characteristics and oil zone-gas cap relationship.

An extensive engineering study of the field was begun by Core Laboratories, Inc., in May, 1954. Data developed by this study figured prominently in the unitization and in the recently initiated program of pressure maintenance by water injection.

While Core Lab was making its study, the operators formed a joint engineering and geological committee to determine equities among the various interests in the field, and related matters.

A unit agreement was worked out, with one operator holding out four leases totaling 720 acres. A land committee made up of representatives from Pure, Lion Oil Co., and Falcon Seaboard Drilling Co. was set up to get approval of the many royalty owners.

The state conservation commission approved the unit in December, 1955 and Pure took over as operator on Jan. 1, 1956.

The one operator (Petroleum, Inc.) that did not join the original agreement came in last October, thereby making the entire field unitized, except for some nonproductive edge leases on the southwest flank.

Unit operation has been successful so far, according to the state conservation commission, the unit operator, and various royalty owners.

The Adena unit set a precedent for operation of production on nonfederal lands in Colorado.

The new regulations of the commission also established a precedent in the state.

There is no similar operation in the state, and similar regulations have not been put into effect elsewhere. Generally speaking, regulation in the state is on a per-well basis, with a limiting gas-oil ratio.

TV: A New Eye for Exploration

Oil exploration may get a helping hand from a new, pint-sized television camera that can see underground.

The miniature probe was developed in West Germany by Grundig Radio-Werke GmbH, of Fuerth, Bavaria, in cooperation with engineers L. Mueller, of Salzburg, J. Hunger, of Kiel, and W. Petri, of Munich.

"Down-hole" TV cameras are also being developed in this country (PW —Apr.19'57,p24), though primary use will be for drilling operations and inspection of pipe.

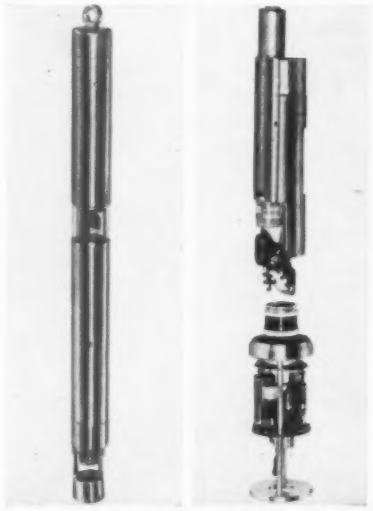
The West German TV camera—reportedly the smallest known yet—is used to study geological formations in small bore holes up to 1,000 ft. in depth. The 2.4-in. probe is run into a 2½-in.-diameter boring, and is said to work even if the hole is filled with water. The probe is attached to a 30-core cable, which can be sunk into the hole without interruption or sliding contacts. The equipment is independent of the direction and straightness of the bore hole.

The camera is equipped with a motor-driven revolving mirror, circled by six bulbs, and mounted on an off-center shaft (pictures). As the mirror revolves, the selective illumination system lights up the walls of the hole, which are then measured by polar coordinates.

The down-hole picture is transmitted through a control set mounted above ground. The picture of the formations then appears on a viewing screen.

All necessary equipment can be installed in 20 minutes. A special computing procedure was developed to analyze the results of measurements.

It is not known yet when the tool will be available in this country.



TV CAMERA, developed in West Germany, is sheathed for trip underground (left). A mirror and lights are visible through window. Down hole, the camera picks up reflections from mirror. The cutaway picture (right) shows how it works.

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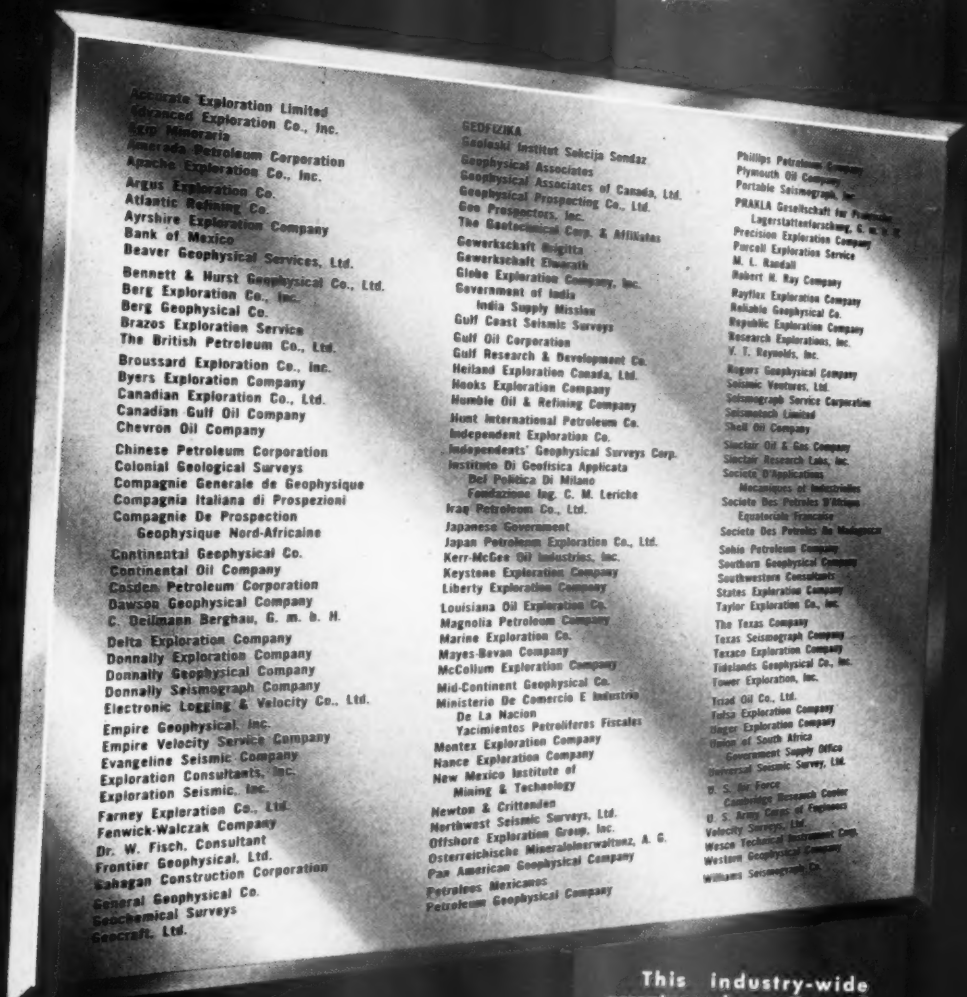

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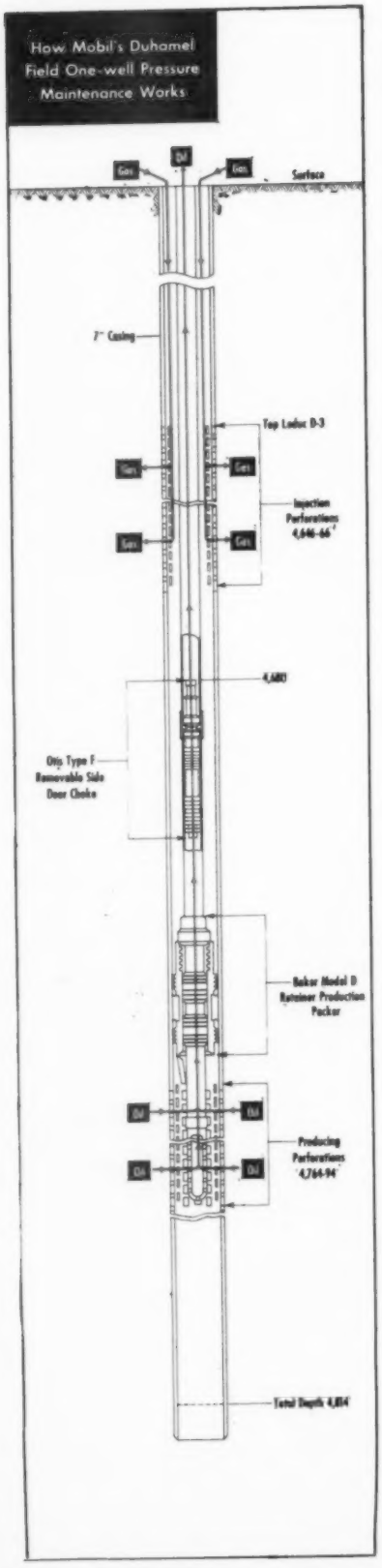


A pressure maintenance method "never tried on this continent before" is being launched by Mobil Oil Co. of Canada, Ltd., in its Duhamel field, in Alberta.

Company officials also said that the new method was made possible by "the combination of a perfect oil field and skillful engineering."

The Duhamel field, located near Camrose, Alta. (map), now produces about 1,800 b/d of oil. It was the first field discovered by Mobil in Canada, and has been producing for seven years.

In the new method, gas is injected in one well to maintain pressure in the entire field. At the same time, oil is also produced from the same well. The dual-purpose well is Mobil's No. 32-3 Duhamel.

Gas is forced down the annulus between the casing and tubing, and enters the formation gas cap through perforations at 4,646-66 ft., in the Leduc D-3 (Devonian) formation. A packer separates the oil and gas zones (drawing).

Mobil considers the Duhamel field "perfect" for this type of pressure maintenance, because the gas-oil contact remains horizontal as the oil is produced. The injection gas spreads out in the formation without sealing off production around the bore hole.

The dual well eliminates the eventual need for pumping facilities in the field. This would have cost the company an estimated $10,000 per well. Company engineers believe the new program will maintain pressure for all 28 wells in the field.

Mobil estimates that the cost of the dual-purpose completion is about $7,000. This compares with a cost of $50,000 to $60,000 for drilling a separate injection well for the field.

A company spokesman says the increase in ultimate recovery because of the new program will be negligible. But this is a minor consideration, he says, since the project is essentially a conservation scheme.

Mobil's chief petroleum engineer, P. A. Taylor, and assistant chief petroleum engineer, S. F. Bird, are credited with development of the project at Duhamel.

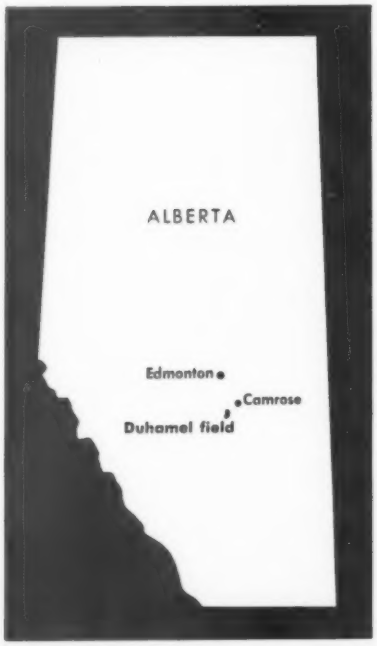
About 1-million cu. ft. of gas per day is being forced through the single injection well into the formation, to maintain reservoir pressure of 1,500 psi. The rate of field production had been threatening a decline in reservoir pressure. While there was no evidence yet that reservoir energy was being wasted, Mobil believed it to be in the best interests of conservation to halt the potential decline. Pressure in the reservoir is now 1,400 psi.; eventually it will be increased to 1,800 psi.

About half the gas used for injection comes from the Viking gas sand, which is tapped by No. 29-14-A Duhamel. The sand, averaging 16 ft. in thickness, topped at 3,440 ft., covers a tract of 600 acres, and assures the company of a sufficient supply to last the life of the Leduc D-3 reservoir. Lease gas makes up the remainder of the supply.

Mobil believes that the Duhamel field has a life-expectancy of about 25 years as an oil producer. Eventually, after oil reserves are depleted, it will become a gas field.

Geologically, the Duhamel field occurs at the northern extremity of a reef mass which includes the Malco and New Norway fields farther south. An electric analyzer study has shown that, while porosity is continuous over areal extent of the reef, a partial permeability barrier occurs between Duhamel and the fields to the south.

A reservoir study of the field, presented to the Alberta Petroleum & Natural Gas Conservation Board, showed that a high degree of gravity segregation has taken place in the reservoir. Engineers stated, however, that it was necessary to supplement this source of energy in order to maintain pressure.



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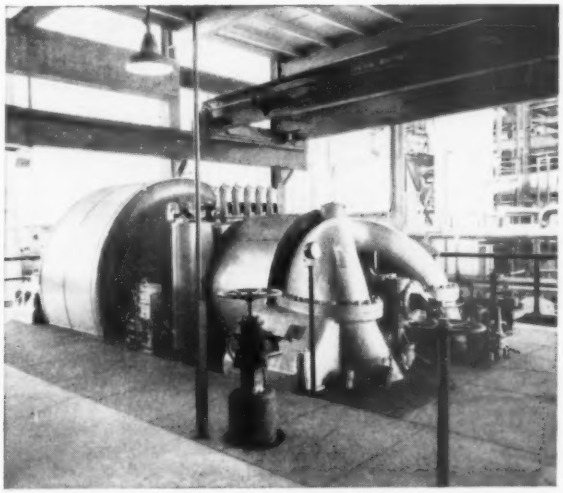
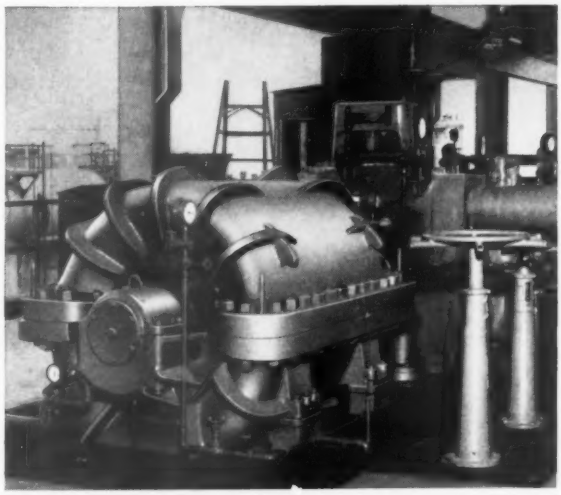
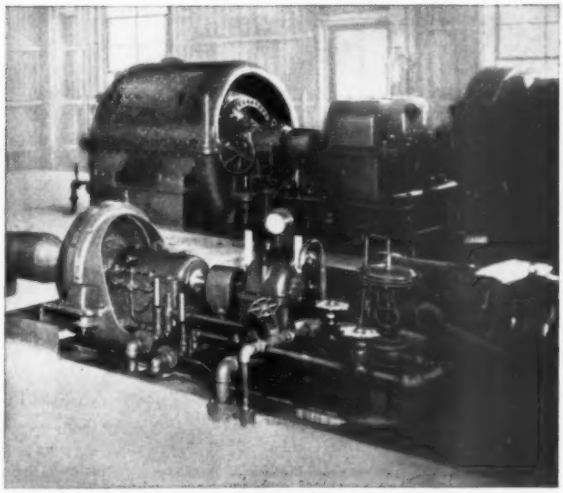


Main Air Blowers. Ingersoll-Rand multi-stage Turbo-Blowers meet all requirements for main air blower service in catalytic cracking plants. They have been built for capacities up to approximately 160,000 cfm. Although usually driven by I-R steam turbines, they also can be driven by combustion gas turbines or electric motors.



Gas Compressors. Ingersoll-Rand centrifugal compressors can be supplied for all gas discharge pressures and capacities encountered in catalytic cracking service. A variety of sealing arrangements is available and two or more units can be operated in series and tandem, providing virtually unlimited range and flexibility of ratings. They can be powered by I-R steam turbines or any other type of drive.



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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Upswing Forecast For Canadian Drilling

"The Canadian oil industry must step up its drilling by at least 20% over last year's rate, to meet anticipated market demand of 1.4-million b/d by 1967," Paul L. Kartzke, vice-president, Shell Oil Co., said at a meeting of the Canadian Assn. of Oilwell Drilling Contractors in Calgary last week.

In estimating future Canadian market requirements, Kartzke noted that the present ratio of reserves to production is 18 to 1, compared to a ratio of 10 to 1 in the U.S. "To preserve a reasonable backlog of 15 to 1," he said, "the industry will have to discover 7.5-billion bbl. of oil during the next ten years."

To find and develop such reserves, some 38,000 wells will have to be drilled—roughly twice the number of wells that have been drilled in Canada since the industry began. Based on an average depth of 4,000 ft. plus, 160-million ft. of hole will have to be drilled.

Regarding Canadian exports, Kartzke referred to the "large, crude-hungry markets now appearing in the Pacific Northwest, the North Central states, and possibly Japan." By 1967, he said, the industry will be exporting approximately 400,000 b/d of crude.

"In ten years," Kartzke said, "the Canadian oil industry will be supplying 70% of all Canadian needs, as compared with the present 54%."

•

Properties Change Hands

Sunray Mid-Continent Oil Co. has bought the oil and gas properties of Arkla Oil Co., Inc., of Tulsa, comprising 16,000 acres of developed and undeveloped leases in the three-corners area of Arkansas, Louisiana, and Texas.

Sunray acquired interest in 41 wells with net production of about 900 b/d. The company also acquired a gasoline plant near Rodessa, La.

Renappi Corp., of Wilmington, Del., a Du Pont concern, has paid over $2-million for producing properties in Harrison and Panola Counties, East Texas. Sellers were Fred Whitaker, of Carthage, Tex., and J. C. Trahan, of Shreveport, La.

Whitaker received $45,920 for four gas well units in the Carthage-Bethany area, and two in the South Hallsville field. Trahan received the balance for 14 units in the two counties.

Seaboard Oil & Gas Co., Wichita Falls, Tex., has bought a natural gasoline plant in North Texas from Centurion Oil & Gas Co., Dallas.

The plant is located in the East Risch field, Jack County. Price for the skid-mounted unit was given as $200,000.

•

Seismic work is underway in Alaska's Koyukuk River Basin in the Yukon. Contractor for the work, Global Enterprises, Inc., Denver, will spend the summer and, if necessary, the early winter in the area searching for drilling sites.

The area has been a hot spot since Fairbanks Gas & Oil Co. started the move into the Yukon in 1954. More than 3-million acres are now under lease.

Global's venture is backed by Paul G. Bendum, president of Hiawatha Oil & Gas Co., who, with his family, holds leases on 600,000 acres 300 mi. west of Fairbanks.

Farther south, Humble Oil & Refining Co. is about to start drilling a 12,000-ft. test on the Alaska Peninsula, near Kodiak Island.

•

A high bid of $331 per acre was received for lands in McKenzie County, N.D., at a sale held by the Bank of North Dakota at Bismarck, June 20. High bid was submitted by Farmers Union Central Exchange for an eight-acre tract near McKenzie County production.

A total of 8,647 acres leased at the sale brought bonus bids of $40,692. Acreage offered was scattered through several western North Dakota counties.

•

Sinclair Oil & Refining Co. has awarded contracts to the J. Ray McDermott Co. for two offshore drilling platforms. They will be used in the Eugene Island area off Louisiana, after completion in September.

Each of the structures will be used to drill 12 wells, and will then be converted into production platforms.

One of them will be located in the Block 175 field, where Sinclair has production. The other will be in Block 190, south of company production in the Block 88 field.

Rimrock Tidelands, Inc., has the contract for the drilling, and will move two new rigs to the sites.

•

Britalta Petroleums, Ltd., Calgary, has extended its exploratory activities eastward into Ontario, by contracting to purchase all outstanding stock of Colonial Petroleums, Ltd., an Ontario corporation.

Britalta says potential producing horizons in Ontario are relatively shallow, making exploration costs far less than in the western provinces.

Survey work will start at once in Camden-Gore, near Dresden, in southwestern Ontario, on 8,000 acres acquired in the purchase.

Britalta has also agreed to buy an undivided quarter-interest in 21 exploratory licenses issued by the Province, covering more than 100,000 acres of Crown lands under the waters of Lake Erie, adjacent to Essex County.

•

Drilling contractors of the Four Corners area and the San Juan Basin have organized a new chapter of the American Assn. of Oilwell Drilling Contractors.

J. M. Riddle, Moran Bros., Inc., was named chairman, and Robert E. Jackson, Empire States Drilling Corp., was elected vice-chairman. A chapter secretary will be elected later.

The new AAODC group, to be known as the Farmington Regional Chapter, becomes the 19th in the association's chapter organization.

•

A $10-million exploration program for Western Canada has been set by Sinclair Canada Oil Co., a wholly owned subsidiary of Sinclair Oil & Gas Co.

More than $4-million will be invested in Alberta. An equal amount will be spent in British Columbia, and the balance in Saskatchewan. The program will include the drilling of ten wildcat wells.

Sinclair's program stems from its acquisition last year of assets and pro-

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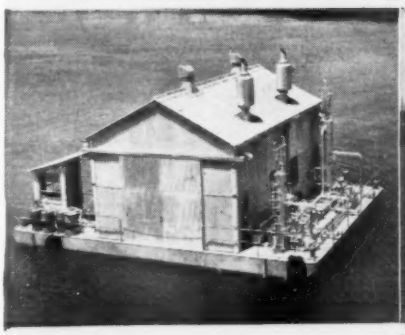

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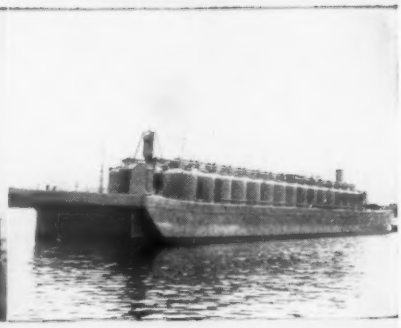

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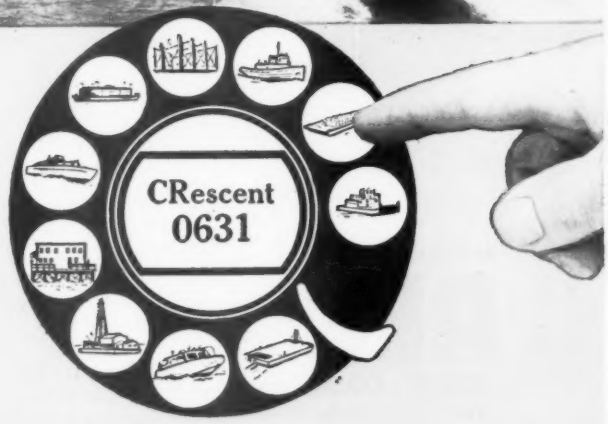

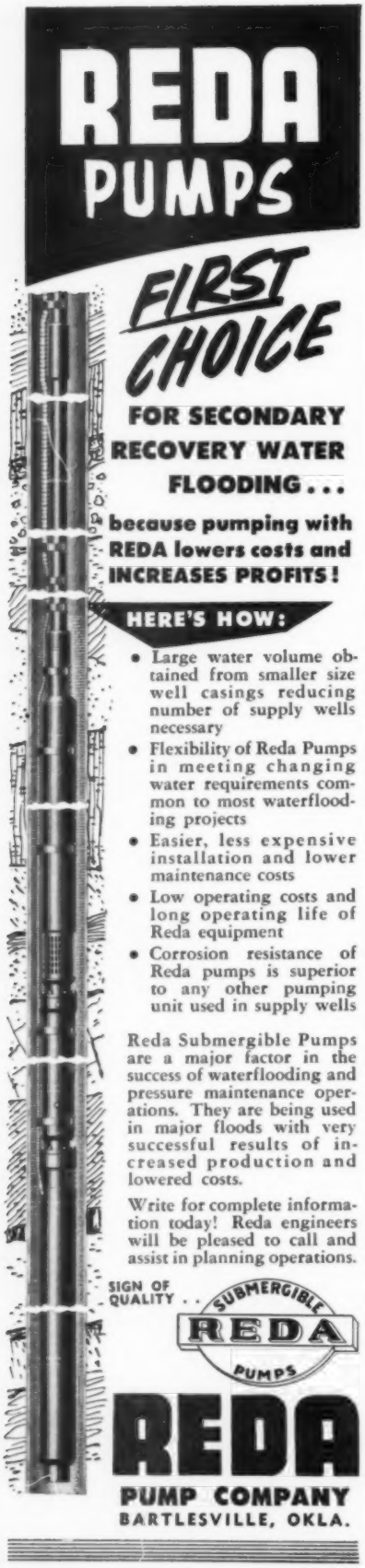
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General American Oil Co. has completed negotiations for drilling the deepest wildcat in Mobile County.

The company will drill a proposed 13,500-ft. test in section 36-2s-2w to make the first Alabama test of the Hosston (lower Cretaceous). The wildcat is 8 mi. northwest of Mobile and 17 mi. southeast of Citronelle field, where deepest production is about 11,500 ft.

•

Shamrock Oil & Gas Corp. will limit its crude oil purchases during July in four Panhandle counties because of an oversupply.

Buying will be cut 25% in Hansford and Ochiltree Counties and 25% below the May take in Moore and Hutchinson Counties.

•

Drilling Highlights

Nebraska—Pan American Petroleum Corp. No. 1 State of Nebraska, section 16-17n-55w, Banner County, was completed on pump for 138 b/d through perforations in the Muddy at 6,430-38 ft. The wildcat is about 5 mi. northwest of Vowers field.

In Red Willow County, Mast Drilling No. 1 Poore, section 29-2n-29w, recovered 380 ft. of gassy 34-gravity oil, and 50 ft. of oil- and gas-cut mud on drillstem test in the Lansing-Kansas City at 3,620-50 ft. The wildcat is 24 mi. south of Barger field.

Utah—Paradox Production and Putnam & Smoot No. 1 Federal, section 34-30s-13e, Wayne County, recovered gas at the rate of 380,000 cu. ft. daily on test of the Pennsylvanian at 3,504-22 ft. The test is the only one drilling within a radius of 20 mi., in the extreme northwest of the Paradox Basin.

Colorado—McKnab Drilling No. 1 Jess, section 14-4n-58w, Morgan County, recovered gas at the rate of 1.5-million cu. ft. daily on test at 5,818-28 ft. in the D sand. Recovery was 90 ft. distillate and 270 ft. water.

Oklahoma—The Texas Co. No. 1 Dexter, section 7-7s-3e, Love County, flowed 37 bbl. of distillate in 11 hours through 7/64-in. choke, with 1,050,-000 cu. ft. of gas daily from perforations in the Oil Creek (Ordovician) at 8,705-15 ft. and 8,725-35 ft. This will be the second producer in the Southwest Enville field, in a new area for the state.

In Cleveland County, Herman Brown No. 1 Foree, section 21-9n-1w, previously completed as a Simpson Dolomite zone discovery in Northeast Falls field, was plugged back to Viola (Upper Ordovician) and perforated at 6,921-36 ft. to flow 74 b/d through 12/64-in. choke. The Viola is a new zone for the Second Wilcox field.

Louisiana Offshore—Humble Oil & Refining Co. No. 1-A, Block 24, West Delta area, was completed for 67 b/d of 54.2-gravity condensate and 1,643,-000 cu. ft. of gas daily through perforations at 12,490-510 ft.

South Dakota—Shell Oil Co. No. 32-17 Graves, section 17-21n-4e, Harding County, swabbed 15.6 bbl. of oil per hour plus 2.4 bbl. of water in test of two zones in the Red River (Ordovician) at 8,608-24 ft. and 8,672-700 ft. The test is 1 mi. southwest of the two-well Buffalo field, only production in the state.

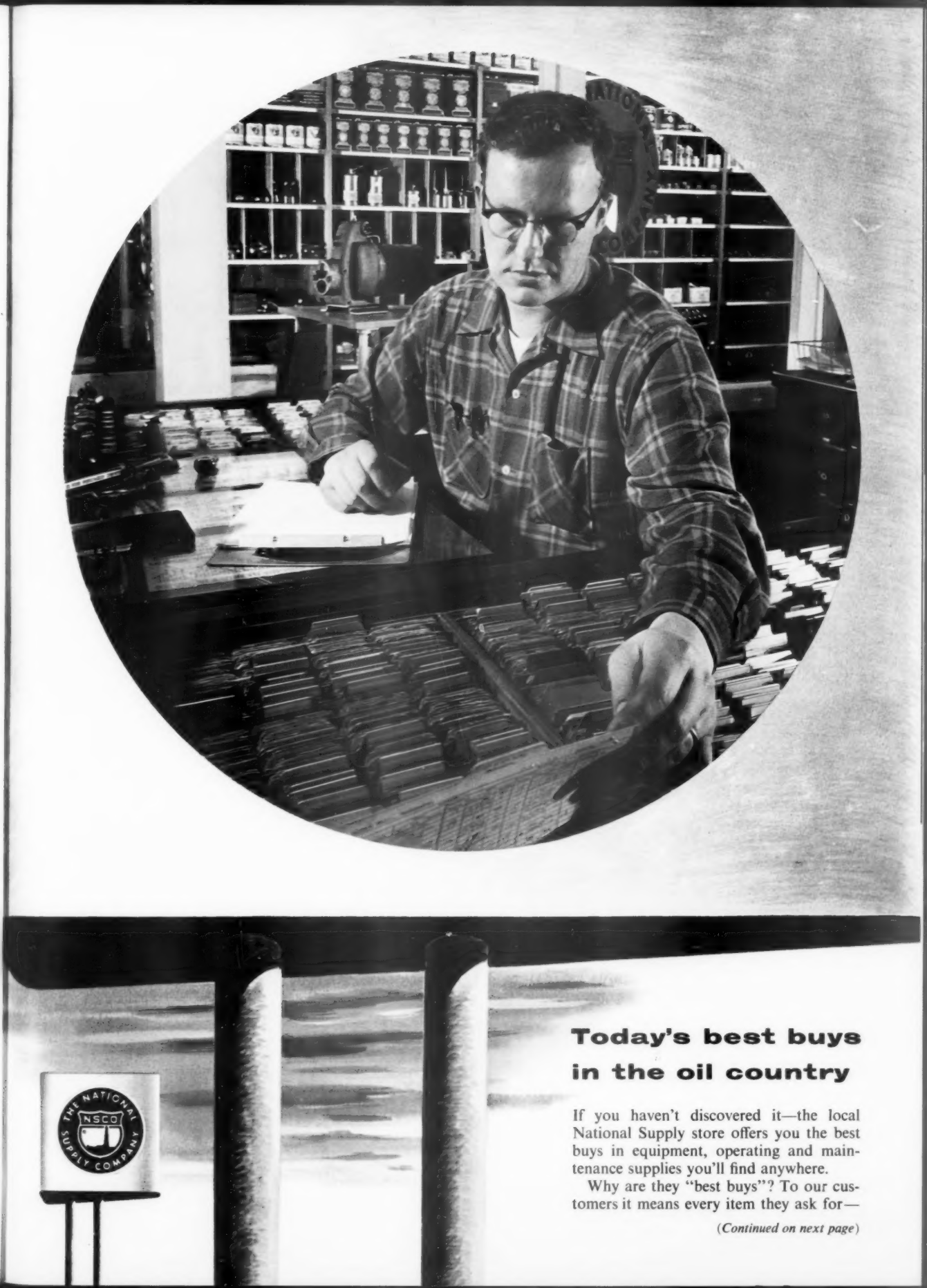
West Texas—Slick Oil Corp. and Bankline Oil Co. No. 1 Ross Atkins, section 28, block 10, H&GN survey, Pecos County, flowed 40-gravity oil at the rate of 109 b/d through 9/64-in. choke on 3-hour test of the Ellenburger at 7,440-80 ft. The discovery is 2½ mi. northwest of Heiner field.

In Scurry County, Liedtke, Ltd., and R. J. Zonne No. 1 P. L. Fuller, section 556, block 97, H&TC survey, Fuller sand discovery nearly 3 mi. east of the Cogdell area, was completed on pump for 137 b/d of 39-gravity oil through perforations at 5,032-36 ft.

North Dakota — Northwest Oil Drilling Co. No. 1 Ed Bunting, section 5-162n-91w, Burke County, recovered 354 ft. of clean oil and 570 ft. of heavily oil- and gas-cut emulsion on drillstem test of the Midale-Nesson pay (Mississippian). The wildcat is 5 mi. south of Flaxton field.

Mississippi—Skelly Oil Co. and KenArk Co. No. 1 Dexter, section 8-1n-13e, Walthall County, flowed 3-million cu. ft. of gas daily on test of the Paluxy at 13,516-30 ft. There is no other gas production in Walthall County.

British Columbia — Pacific Petroleums Ltd. No. 93 Pacific Charlie Lake, Lsd 14-5-83-18w5, has recovered the first Cretaceous sand oil in the Fort St. John gas field. On drillstem test at 3,320-40 ft., gas surfaced in 3 minutes, and oil flow in 45 minutes was estimated at 17 bbl. per hour. When pipe was pulled, there were 800 ft. of oil and 100 ft. of oil- and gas-cut mud.



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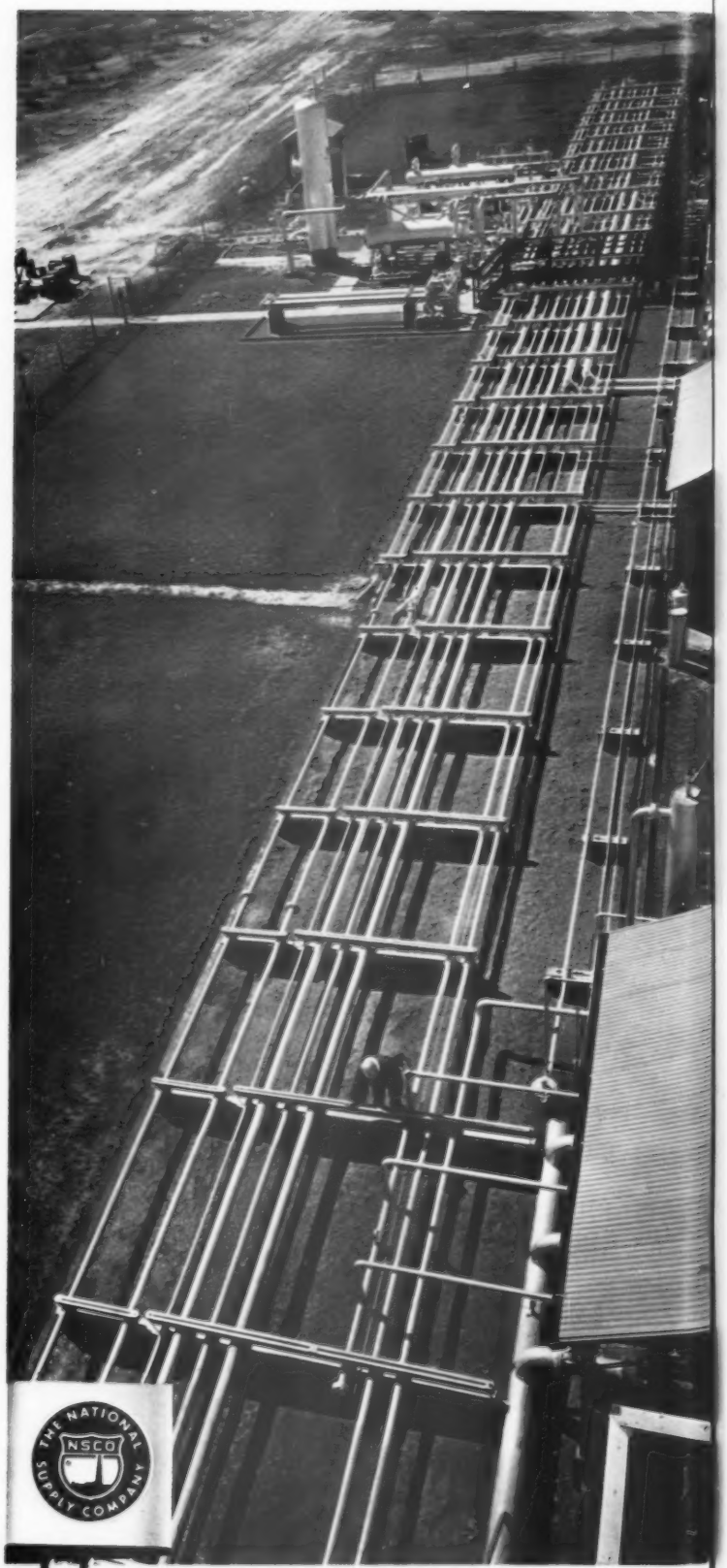

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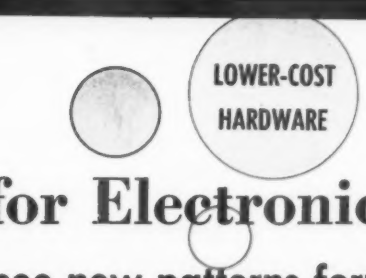


Where Next for Electronics in Oil?

Computer specialists see new patterns forming

In the next five years, oil policy-making based on machine data will move from the planning stage into reality. This is the standout fact in a look at oil's electronics future by Datics Corp., of Fort Worth, specialists in electronic computing and data processing.

All of the company's seven professional men have had experience with oil problems, four of them having worked for oil or gas companies. Datics' service facilities include an IBM 650 computer, and data reduction equipment.

Based on his firm's broad-range view of industry activity, Datics President K. L. Austin says, "Interest in helping oil management make decisions through use of computers is intensifying, and will continue to grow. Such help is not a development that will come in ten years. It is occurring now, and will be common practice in five years.

"The hottest thing in computer applications is optimization, operations research, and linear programming techniques—activities that aid policy-making."

Austin adds, "Of course, a lot of machine time is being given to production and process engineering, accounting, and other near-term-payout problems. But other oil companies are now beginning to join the pioneers in recognizing the large potential of computers in helping to make tough decisions."

With a computer, management can predict the effects of a decision before putting it in force. One reason long-range policy problems are among the best computer applications is this: It may take a long time to set up the program, but after this is done, it's easy to make changes.

In specific computer applications, Datics sees a limitless extension of progress now being made in production and process engineering. The company lists these applications among those getting closest attention:

- Heat and material balances around plants—useful to the process design engineer, especially for plants involving recycle streams.
- Theoretical flame temperature calculation — important in petrochemicals. Theoretical effluent composition may be calculated.
- Refinery optimization—ability to simulate any unit of a refinery and determine the approximate operating result.
- Gasoline blending — closer blending of components that go into all grades of gasoline.
- Shipping—calculation of optimum shipping tables for distribution of large quantities of products between multiple origins and destinations.
- Reservoir mechanics—calculation of the pressure decline in oil reservoirs.
- Gas network calculations—to determine the pressure throughout a network of pipelines. This enables the engineer to predict how much more horsepower he will need to install in the future, as far ahead as 30 years.

Datics also believes new attention will be given to instrumentation studies on distillation columns, and to unsteady state processes in refineries.

R. L. McIntire, Director of Computing Services for Datics has been plugging for the digitalization of electric logs. It would involve using data-reduction equipment to reduce oscillograph tracings to card form with numerical data. This would allow comparison of electric logs, and location of fractures in reservoirs, on a digital computer. The system would replace manual scanning of oscillograph tracings.

In addition, Datics sees continuing expansion of internal accounting applications. More and more oil companies are using computers for tax computations, run tickets and royalty checks, dividend calculations, and almost any kind of bookkeeping.

Biggest problem ahead in computer use? For a while it will continue to be the trouble in getting enough skilled specialists with a broad outlook.

"Manufacturers actually are turning out computers faster than many companies are able to use them," says Ryan. "Computers have been misused or actually left idle because companies receive them before their staffs are assembled and properly trained.

"Computers are tools, and, unless you have men who can use them, they mean nothing. The big bottleneck today is in locating, selecting, and training men."

Says Ryan, "Manufacturing firms give some instruction. Universities are now getting computers and offering computer courses. All of this will help, but it will still be up to the oil company to train its men adequately."

Ryan also sees a need for selection of higher-caliber men for computer work. "A keen, questioning mind is the main quality," he says. "Engineering and mathematics are a help, but are not essential if the other qualities are present. But you also need men with an over-all view. Most employees are tied too much to one phase. Orifice meter calculations might be all they know. They can't put a program on the computer because they haven't the broad picture."

Some companywide operations will be coordinated from a central computer station in two to five years,

Datics predicts. But this won't necessarily mean a rush to centralization. "I had rather put the computer where the problem is," says Austin. "Whether centralization will come or not, I can't say, but I don't believe in it. I don't think it is economically feasible to use huge computers to work problems that could be done on much cheaper equipment. All levels of management and technical people should have computer facilities available.

D. W. Patterson, director of data reduction services of Datics, analyzes today's parallel trends toward smaller local computer systems or toward one big central processing unit this way: "Eventually, information will probably be computed by smaller systems and transmitted to central systems for coordination.

"Greater centralization will come at first. Then, as more people in a company participate in the use of automatic techniques, decentralization will occur. The full possibilities will not be realized until management has accepted the inevitable and is able to coordinate its efforts fully."

The timetable for central computer coordination will be governed by advances in automatic communications. "Progress along this line," says McIntire, "has been slow and expensive. It may take another five years to work out the bugs and allow centralized data processing to take hold in a big way."

Improvements in data collection methods particularly will be opening new doors to computer problem-solving. Says Patterson, "Oil companies face the question of what to put on a machine. Two types of problems are now applicable: (1) standard engineering or design problems with information well in hand; and (2) problems that involve gathering a large amount of data—such as field data—before they can be solved.

"For example, there are vast quantities of seismic data that could be computed if they could be reduced in a way acceptable for computer output.

"At present, engineering problems are most easily applicable, because they may be formulated and solved at a central location. But more advanced techniques in data collection and processing are only a matter of time."

Electronic hardware will continue to be improved rapidly. Datics sees a need for a computer "erector set." "Of great value," says Austin, "would be a 'general purpose-special purpose' machine, a machine without specifications. Such a set would be composed of a variety of black boxes of hardware that could be used in different combinations to do a variety of jobs. Machine components could be broken down into blocks, which could be built up to handle specific needs.

"Present-day technology, combined with clever design specifications, can result in such a system."

More smaller machines will be introduced. The trend in this direction will be speeded, says McIntire, because "the spectrum of computers in the $2,000-a-month rental figure needs filling in." He also sees demand for a cheaper automatic plotter, and for work to tie analog and digital computers into the same system.

Datics believes the industry's good progress in realizing computer potential would be hastened with full management confidence and understanding of the potential and theory of computer usages.

McIntire explains, "Firms should do more to acquaint more of their management and supervisory people with the possible programs. Training courses and seminars on company time should be expanded, and middle management should have the definite assignment of getting acquainted with computers."

Adds Patterson, "The oil industry can profit by close association with other computer and data-processing-machine users. At present there is a lot of duplication of work."

Datics doesn't think independent oil companies are active enough in electronics—mainly because of high costs and the personnel shortage. It believes that the laggards will be hurt competitively. Patterson says that major oil companies are well aware of the problems and approaches in computer work.

Generally they are giving electronics as much attention as possible, considering the deterrents.

"However," he adds, "any company, including a major, that falls behind in electronics will have a rocky road. It will get sales results late, react late, and won't have nearly so much information at its fingertips.

"Without computing facilities, a company will have to operate at reduced efficiency. It will have higher operating costs and lower profits. It will not keep up in exploration and production research."

McIntire sees a further problem in customer relations. "Competitive emphasis is placed on the computer," he says, "by the customer who is becoming more and more aware of automation. In a few years he will believe efficient service is impossible without some form of automation. Electronics is a natural as a sales pitch. Many smaller firms should give computers more serious thought, since the economic advantages are there for them as well as for the large corporations."

To keep pace, Datics believes the independents will have to turn to outside help. Austin explains, "The problem is to provide the smaller companies with the facilities and awareness that the big firms have now. This requires removing the obstacles of manpower and prohibitive cost. And one solution is to use outside organizations with computing facilities and services. These provide the smaller outfit with a 'proving ground' in determining their electronic requirements.

"When the independents are shown they can make a profit by using computers, by renting equipment or using outside services, they will get into the automation whirl."

What's New
IN MANAGEMENT

Oil companies are now counter-attacking a threat to the tax-deductibility of institutional advertising—and of a range of public relations programs.

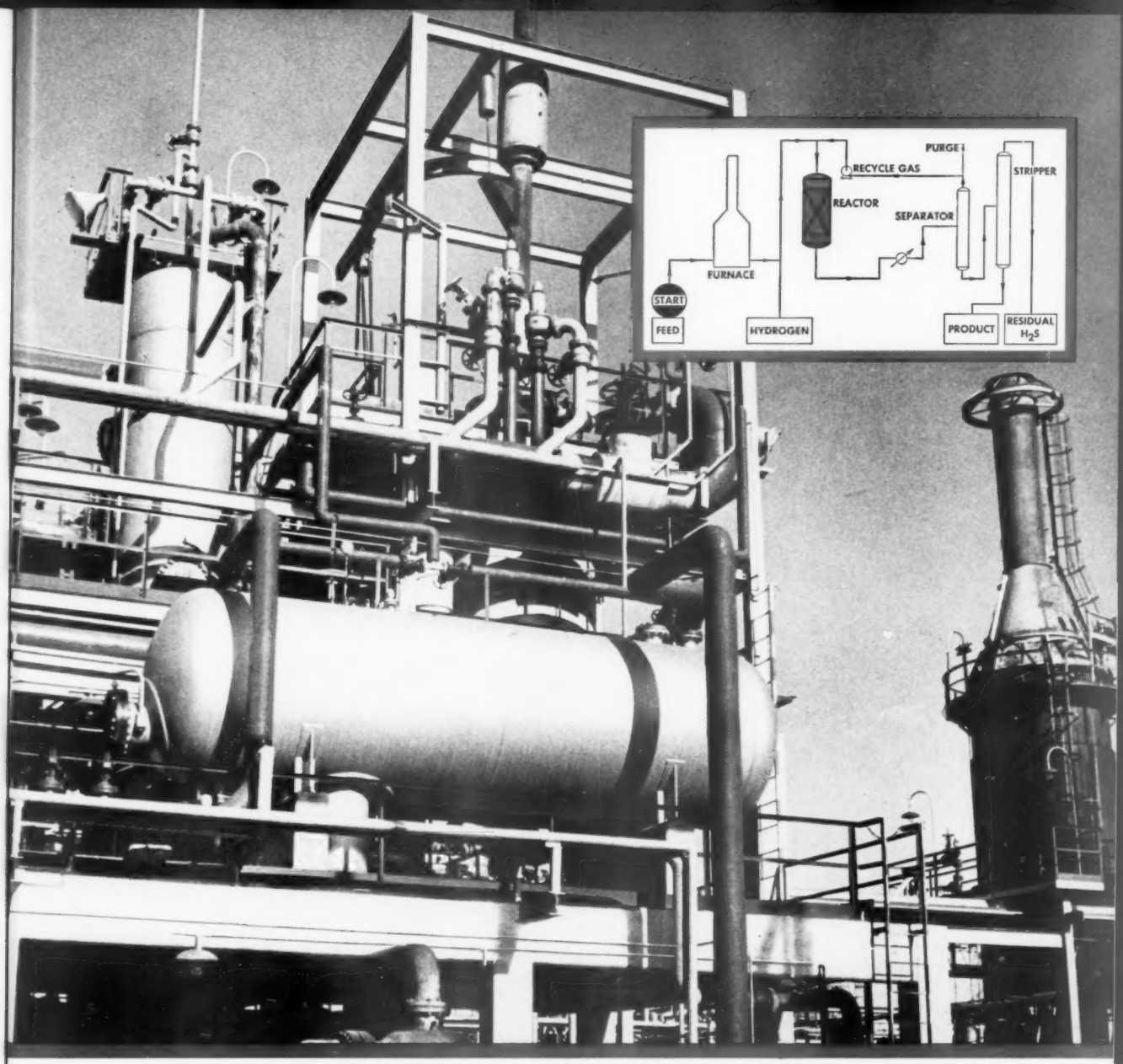
A proposed revision of the Internal Revenue Code bans tax deductions for lobbying purposes. Oil public relations men have no argument with that. Nor do they think contributions to political parties for political purposes should be deductible. But they object to hazy wording that could be construed to bring good-will and public-education efforts under the definition of lobbying.

The Public Relations Society of America, in which the oil industry is widely represented, is asking IRS to clarify the wording.

•

Backwash of last month's Supreme Court decision in the Du Pont-General Motors case is beginning to be felt in the oil industry. The decision is now an issue in the Federal Trade Commission's antitrust charges against Gulf Oil Corp.'s acquisition of Warren Petroleum Corp.

Since the court ruled that the Clayton antitrust act applies to vertical as well as horizontal acquisitions (PW—Jun.7'57,p11), an FTC attorney is trying to show that Gulf's widespread industry holdings are a relevant factor in the Warren case. FTC is claiming that Gulf's merger with Warren lessens competition in liquefied petroleum gas.



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Creole's huge new TJ-2 gas injection plant goes into operation in Lake Maracaibo—as

Another 'World's Biggest' for Creole

CARACAS—The world's biggest gas injection plant—Creole Petroleum's Tia Juana 2—was inaugurated last week on a 1.3-acre platform in Lake Maracaibo.

Its daily capacity of 300-million cu. ft. is more than double that of the Tia Juana 1 plant, which previously held the world title with a daily average of 143-million cu. ft.

Built at a cost of $28-million, TJ-2 injects gas at a pressure of 1,800 psi. through four wells into as many reservoirs of the 9,874-acre LL-453 area, 7 mi. offshore from Tia Juana on the eastern side of the lake. Test operation began in mid-April.

TJ-2 boosts Venezuela's installed gas injection capacity by 55% to 850-million cu. ft. daily.

The plant is Creole's seventh, and the second of a series of big units scheduled for Lake Maracaibo. The other present plants are at Cumarebo, Mulata, Jusepin, San Joaquin (a three-plant system), and Quiriquire.

The general objectives of the plants are: to increase the ultimate recovery of oil through maintenance of pressure at high levels; to conserve gas until it can be used effectively in the future; to maintain lower operating costs through continued production of wells by natural flow; and to increase the efficient rate of crude recovery.

Creole reportedly has plans for another seven gas plants.

The total includes one planned for the Bachaquero field, farther south in the lake, and Tia Juana 3, on which construction will start this month. The latter will have the same capacity as TJ-2 and is scheduled for completion in 1959.

The company's total investment in gas conservation and utilization will reach an estimated $175-million by 1960.

This includes an $11.2-million LPG plant, which Creole is now building at Ule, on the lakeshore (PW—Jan.4 '57,p29). It will produce 5,300 b/d of propane, 5,600 b/d of butane, and 6,000 b/d of gasoline from liquids extracted from the TJ-1 gas stream.

TJ-2 is expected to increase ultimate crude recovery in four Eocene reservoirs by approximately one-third.

The LL-453 area produced 270-million bbl., from completion of the discovery well in April, 1945, through 1956, out of an estimated total of 2.3-billion bbl. originally in place.

Reservoirs are truncated monoclines with dissolved gas drive and secondary gas cap. Net thickness of producing sands averages 225 ft.

Construction of TJ-2 started in September, 1955. The platform stands in 85 ft. of water, supported 15 ft. above the surface. The plant has four cranes ranging up to 40-ton capacity for handling turbines and compressors.

Twelve 8,000-hp. centrifugal compressors are arranged in two six-stage systems in parallel. They are powered by twelve 8,000-hp. Westinghouse single-shaft gas turbines—the world's biggest gas turbine concentration.

Some 28 mi. of gathering lines, ranging up to 30-in., supply gas from 12 flow stations at an intake pressure of 39 psi. The injection system totals 5½ mi. of 10-in. line.

The plant burns 28½-million cu. ft. of gas daily as turbine fuel. Compression condensate amounts to 3,000 b/d.

Creole is studying an integrated gas gathering system to collect virtually all of the gas produced in the entire Bolivar Coastal Field area of the lake. It involves lines up to 40-in. that would be laid in water up to 100 ft. deep.

Creole's lake plants are getting progressively bigger and costlier.

TJ-1, inaugurated early in 1955, has ten 6,000-hp. turbines, and cost $20-million. TJ-3 will have 14 gas turbines and will cost something over $40-million, including an expensive gathering system.

Unlike the first two lake plants, which are pressure-maintenance installations, TJ-3 will be a combined gas-lift and pressure maintenance unit.

It will inject 50-million cu. ft. daily at 800 psi. for gas lift of wells in the TJ-102 area, as well as 250-million cu. ft. daily at 1,900 psi., for pressure maintenance in the LL-5 reservoir. It will increase ultimate crude recovery by an estimated 450-million bbl.

$30-Million Oil Hunt Pushed

RIO DE JANEIRO—Brazil's Petrobras is putting almost all of this year's $30-million exploration budget into its Amazon basin push, in hopes of establishing production there.

Its two oil finds in the region have not yet proved the prospects for commercial output (PW—Mar.8'57,p44). But a successful drillstem test of the No. 2 Nova Olinda well earlier this year promised a good start when it was estimated capable of producing about 500 b/d of high gravity crude.

The well is located on the river island of Maraca, about ½ mi. from the No. 1 well. The latter found the first oil in the Amazon in early 1955. Capable of producing only 10-20 b/d, it proved noncommercial, but failure is attributed to faulty casing installations.

A 45-day test of the No. 2 Nova Olinda oil find produced a total of 1,450 bbl. of crude, with the pumping average ranging from a high of 37 bbl. hourly to zero.

The last week of the test averaged less than 10 b/d at the end of May. The well was shut down, and it was found that paraffin had clogged the pipe. A cleaning unit is being installed, and production tests will be continued within a few weeks to determine the commercial value of the well.

Petrobras, meanwhile, is seeking production at deeper levels in the No. 1 Nova Olinda, which had found oil in the Devonian at 8,924-90 ft. It was originally drilled to a total depth of 9,059 ft., and drilling is now continuing below 9,240 ft.

Two more wells are now being drilled nearby. The No. 3 Nova Olinda is below 10,942 ft., and No. 4 is below 2,995 ft. A fifth rig is on its way to the area.

Two more rigs will be set up shortly in the Amazon basin, one near Manaus, the other near Sampaio; and another two are currently spotted in the Amazon state of Para.

Petrobras is rapidly increasing its already heavy concentration of technical personnel in the Amazon basin. More than half of its total of 33 geological and geophysical crews is at work in the Amazon region, and more will come in later this year. Gravity meter and seismograph crews are also being heavily concentrated there.

In the last few months, Petrobras has been signing up more U.S. personnel to work in its direct employ, in addition to the crews it has under contract.

Iran Oil Grants Sought by Italy's ENI

Locations of the three prospective joint concession areas totaling 8,840 sq. mi., on which the Italian and Iranian government oil companies have reached preliminary agreement, were disclosed recently by the Italian oil journal, Petrolieri d'Italia (PW—May3'57,p52). If the pact is approved under Iran's pending oil legislation, Ente Nazionale Idrocarburi will acquire rights to a 2,162-sq. mi. offshore block in the Persian Gulf; 4,362 sq. mi. north of the consortium's operating sphere; and 2,316 sq. mi. on the Mekran coast, including offshore acreage.

Revise Iran's Oil Bill

IRAN—The outcome of revisions in Iran's oil bill was awaited last week by a wide variety of companies from the U.S., Italy, and Japan, which have been actively investigating the possibilities of oil concessions.

The amendments made by a Majlis oil committee are reportedly extensive, but details are not yet clear.

The changes cap weeks of heated discussions since the government tabled its bill on new concession rights May 16 (PW—May31'57,p38).

One thing is certain so far: Every new oil concession agreement will have to be approved by Parliament.

One Majlis objection to the original bill was followed by an official government statement that, in accordance with the Iranian constitution, "each oil contract between the National Iranian Oil Co. and Iranian or foreign persons or companies should be approved by Parliament before coming into operation."

Among the U.S. groups watching for the final outcome of the bill are some majors, several medium-sized firms, and Texas independents such as John W. Mecom and H. L. Hunt.

Italy's Ente Nazionale Idrocarburi already has a head start with a preliminary agreement it has initialed with NIOC (map, left).

A private Japanese company has been formed in Tokyo for Iranian oil exploration, according to the Japanese Charge d'Affaires in Teheran. The Japanese government will officially back the Iranian venture.

The Japanese official made it clear, however, that the move into Iran will depend on the regulations set up for the prospective joint Iranian-foreign oil companies.

The Japanese company, he said, would apply for one concession in the Tshabahar area on the Gulf of Oman, 70 mi. west of the Pakistan border, and a second in "another Persian Gulf area."

What's New / AROUND THE WORLD

Kuwait Exports to Jump

KUWAIT — Loading capacity of the world's biggest oil loading port will jump 25% in September, to 1½-million b/d.

Kuwait Oil Co. announced last week that it will boost tanker loading capacity at Mina al-Ahmadi by about 300,000 b/d.

An approximately equal increase in KOC's crude production will follow completion of the new loading facilities, a company spokesman said in London. KOC is owned jointly by Gulf Oil and British Petroleum.

Two new berths are being added, each with 24-in. and 12-in. submarine pipelines. The port already has eight oil jetties and five sea berths, each with two submarine lines.

The lines for the first of the new berths were launched on May 11. The 24-in. line will be used to load fuel oil from the new topping units now under construction (PW — Feb.3'56,p34). The 12-in. line will load marine diesel oil. The second new berth will have a 24-in. crude line with loading capacity of about 2,000 tons an hour, and a 12-in. fuel oil line.

KOC is also building a 32-in. crude line to the loading terminal from the main crude tank farm at Ahmadi.

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First Oil Grant

PARAGUAY—International Products Corp. is now negotiating with several American oil companies to develop a 750,000-acre concession in the Chaco region, along the Bolivian border. The company was awarded the concession last week.

This is the first oil venture for International Products, manufacturer of quebracho extract and processor of canned meat in Paraguay.

Exploration rights are for four years, with a possible extension. They can be converted into exploitation rights, with 50% reduction in acreage.

The company will pay royalties on a sliding-scale basis, starting at 10% on production up to 5,000 b/d, to 12% on production between 5,000 and 10,000 b/d, and to 15% on production over 10,000 b/d. Little exploration has been carried out in Paraguay in the past. Union Oil Co. of California did some unsuccessful drilling in the Chaco region several years ago.

International Products' concession acreage is adjacent to Bolivia's southeastern oil-producing region, where Bolivia's government oil company is now trying to step up the rate of development (PW—Jun.14'57,p69).

The first of two projected pipelines into Paraguay is also now under active consideration (PW — Jun.7'57,p50). The governments of both countries recently ratified agreements to cover construction of these export outlets for southeastern Bolivian production.

•

TURKEY—A location in southeast Turkey, in the Mersin-Iskenderun area, will be selected as the site for the 65,000 b/d refinery to be built by a four-company group. The projected refinery will be jointly owned by Socony, Caltex, Shell, and British Petroleum (PW—Apr.10'57,p66). It is scheduled to go on stream in 1960.

The Iskenderun area has been under consideration as a possible terminus for the projected Mideast pipeline from the Persian Gulf.

•

JAMAICA—Pan Jamaican Oil Co. is drilling below 1,040 ft. on its third exploratory test, just 1 mi. west of the first test ever drilled on the island.

The new No. 1 West Negril is 2 mi. east and ½ mi. south of the town of Negril, in Westmoreland Parish on the west end of the island, where Base Metals Mining Corp., Ltd., drilled a dry hole in 1954.

Pan Jamaican recently abandoned its second dry hole.

•

TRINIDAD—The Texas Co. is expanding its Gulf of Paria concession holdings by acquisition of a second Trinidad producer.

The latest is Antilles Petroleum Co. (Trinidad), Ltd., which holds two concessions in the gulf, as well as onshore acreage. Last year, Texaco acquired more extensive offshore acreage through its purchase of the British-controlled Trinidad Oil Co., Ltd. (PW—Aug.10'56,p34).

Last week, McColl-Frontenac Oil Co., Ltd., a Canadian company which

Maracaibo Drilling Barge is Ready

Kermac V-1, the first of two new drilling barges which Kerr-McGee will use for its debut into Venezuelan contract drilling, has been delivered by Levingston Shipbuilding Co., of Orange, Texas. It will be towed to Lake Maracaibo to drill for the Sun Oil Co. group (PW—May3'57,p53).

The barge was bought from Continental-Emsco, which plans to build several.

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is 65% controlled by Texaco, announced that it has accepted an offer from Texaco for the entire stock of Antilles Petroleum, its wholly-owned subsidiary.

Antilles Petroleum's crude production jumped 87% last year to about 6,300 b/d. The jump was due largely to directional drilling offshore into the Gulf of Paria.

Texaco recently has also acquired extensive Gulf of Paria concession interests from Venezuela. It holds 25% interest in six new exploration blocks that Venezuela awarded to a five-company combine (PW—May17'57, p46).

•

CHILE—Esso Standard Oil Co. (Chile) will hold a 25% interest in a new company formed to build a products pipeline from the Concon refinery, near Valparaiso, to Santiago. The new company, called Sociedad Nacional de Oleoductos Ltda., is capitalized at 1.5-billion pesos ($2.7-million).

Cia. de Petroles de Chile holds a 50% interest in the new company, and Empresa Nacional del Petroleo (ENAP) holds the remaining 25%. The new refinery processes Chilean crude.

ENAP, the government oil monopoly, says its production will soon cover all of Chile's oil needs.

•

BOLIVIA—More than 17 U.S. companies reportedly have already submitted bids to develop the 108,000-acre Madrejones area bordering Argentina, under a 35-year contract with Yacimientos Petroliferos Fiscales Bolivianos (PW—Jun.14'57,p69).

The flurry of offers has prompted an extension of the closing date to July 22. The bidders will offer advance royalties to the Bolivan government oil company and will be required to deliver varying percentages of crude and gas production, depending on the extent of recoverable reserves subsequently proved.

Bolivian Gulf Oil has offered $5-million in advance royalties, according to statements of Bolivian oil officials.

T.U.L.M. Corp. also is reportedly among the bidders. This company represents Tennessee Gas, Union Oil & Gas, Lion Oil, and Murphy Corp.

The T.U.L.M. group also recently acquired an option on the former Glenn McCarthy contract area directly to the north. The Minister of Mines & Petroleum says a new contract on that area with T.U.L.M. has already been authorized by a Supreme Resolution. The text has not yet been made public, and some details remain to be concluded before it is ratified.

•

TURKEY—Esso Standard (Turkey) Inc., is now spudding in its second test in Thrace.

The Jersey Standard affiliate abandoned its No. 1 Ceylan at 4,346 ft. It was the first attempt to discover commercial oil in European Turkey since 1937 (PW—May3'57,p53).

The second test, No. 1 Osmancik, is being drilled in the same area.

•

BOLIVIA—A wildcat that will evaluate the oil possibilities of a wide area 81 mi. southeast of Camiri has been spudded in by Yacimientos Petroliferos Fiscales Bolivianos.

The test will be carried to 8,200 ft. at a location 2½ mi. from Machareti, in Chuquisaca Dept. The site was selected on the basis of geological, seismic, and gravimetric work that located new structures on the Mandeyapecua-Carandaiti mountain range.

Bolivian Gulf Oil, which holds oil rights in YPFB's zone, will drill its first Bolivian test at Boyuibe, in Santa Cruz Dept., around Sept. 1 (PW—May24'57,p43). The site is north of the Machareti test, in the Mandeyapecua area.

•

SICILY — The remaining acreage still available for oil exploration—a scant 1.3-million acres—has been subdivided into 55 lots by Sicily's Regional Council of Mines. The total includes small islands and offshore acreage.

Some 445,000 acres of this have been earmarked for the Ente Nazionale Idrocarburi group under an agreement with the regional government which yet remains to be signed (PW—Jun.14'57,p71).

ENI offered the Sicilian government a 25% interest bait to get the new acreage. It also pledged to help accelerate the island's industrialization by building an oil refinery and several chemical plants.

The Sicilian government's 25% bonus from the ENI venture would be forthcoming from extra royalties beyond those payable under the regional oil law, according to one report of the agreement.

Another version is that the Sicilian government will get a 25% interest in the new Coris Co. after it establishes oil production. This company has just been set up in Sicily by ENI, and will hold the new oil rights when they are awarded.

LIQUID MUSCLE FOR INDUSTRY

High on the list of American business achievement stands the swift efficient movement of millions of tons of material – made possible by an endless variety of automatic, time-and-labor saving machinery. Petroleum plays a vital role in this development. In the hydraulic cylinders of lift trucks, for example, move petroleum liquids that revolutionized the art of fast, cost-controlled distribution. Texaco scientists pioneered in creating these amazing hydraulic fluids which change pounds of pressure into tons of lift. The chemical sinews of these liquid muscles are the result of a partnership of research and industry in which Texaco scientists daily seek the new way, the better way.

THE TEXAS COMPANY

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Progress...at your service

GLEASON ROMANS (right) and his chief pilot, J. D. Phillips (left) buy another plane from Bill Piper (center) of Piper Aircraft. Romans' growing fleet is evidence that . . .

Oil Sent Him Sky High

Gleason Romans is a man who can prove that "the sky's the limit" for opportunity in the oil industry. He parlayed a part-time flying school into a prosperous aerial pipeline-patrol company.

Gleason Romans Pipe Line Patrol Co., headquartered across the street from Tulsa's municipal airport, operates 16 airplanes from eight different bases. It has 16 employees—all pilots except a girl who serves as secretary. These flyers keep an aerial eye on more than 5,000 mi. of crude and product lines, in more than a dozen states, for a dozen different clients. They fly about 20,000 mi. per week, more than 1-million mi. per year. And the business is still growing.

But heading an enterprise this size is something that Romans never anticipated when he set out to make his mark in the world.

Romans arrived in the oil industry by a roundabout route, starting as a mechanical engineer in an iron works.

He was born 43 years ago in Salisaw, Okla., where he attended grade school and his first two years of high school. Then he went to Chilloco Indian School (he's part Cherokee), between Newkirk and Blackwell, Okla. Here he gained honors as an athlete—chalking up broad jump and high jump records in Kansas City as a Chilloco track star—in the "Junior College League."

A famous Cherokee friend, All-American athlete Jim Thorpe, helped Romans to get a scholarship at the University of Southern California, where young Romans played halfback on the freshman football team.

He switched to Southeastern State Teachers College, finally to Oklahoma A & M, where he got his degree in mechanical engineering. Then he joined Muskogee Iron Works.

Later, he joined the engineering department of Bethlehem Supply Co., at Tulsa. He was helping to design oil-field equipment when he took a fancy to flying.

He was 27 years old when he enrolled in the government's civilian pilot-training program. He also plunged into part-time training as a mechanic. "I just got a feeling," he says, "that some day flying would be my line of business; I had to learn everything I could."

Aviation became a full-time career for Romans with the bombing of Pearl Harbor. He became a flight instructor, leaving Bethlehem to work for a Tulsa airport operator who had a government training program under way.

This phase of his career, which lasted about a year, produced Romans' first—and only—plane crash. A pilot ferrying a plane to Tulsa was forced down near Duncan, Okla., when the engine froze. To save time and money, Romans and a mechanic decided to clean up the engine on the spot—and fly the plane in—rather than truck the engine to Tulsa for an overhaul. "It was a dumb thing to do," admits Romans.

The engine froze again, right after take-off. The mechanic was not seriously injured. But Romans suffered 13 fractures. He was hospitalized for four months.

His next step was a job on the flight line at a Douglas Aircraft Co. bomber plant—with his own flying school as a sideline.

Putting the B-24s together was a 7 a.m. to 3 p.m. job. There were still several hours of daylight left when he came out of the Douglas plant. So he put $750 of his $800 savings into a $1,500 Piper Cub. The remaining $50 he used to promote "Gleason Flying Service," basically a flight-instruction school, in order to pay off the plane.

Business was so good that he soon bought another Cub—a wrecked craft that he picked up for $150. It took him nine months to get it flying. "I didn't even take time to bathe," says Romans. "I worked at Douglas from 7 to 3. I gave flying lessons after that, up until about 8 p.m. Then I worked on that plane until after midnight."

With two planes finally in the air, he bought another, using the first two as collateral.

Then he doubled his three-plane fleet in one day. Another flight school, with three planes, closed down, and Romans promptly picked up the planes on a credit basis.

Romans got into pipeline patrolling as an experiment, after looking for some way to keep his planes busy when there were no students around.

Giving flying lessons was mostly a week-end business. But his six-plane investment was staring him in the face every day. "I just had to find a way to keep them busy," he says.

The advantages of patrolling pipelines from the air had already been established by Shell Oil Co. and Mississippi River Fuel Corp. But Romans hadn't given pipelines a thought until a friend who worked for a pipeline company told him, "My gosh, Gleason. There's enough pipelines here in Oklahoma to keep an airplane busy all week."

"That was an understatement," says Romans. "I found enough lines to keep all six planes busy, not counting the business that was waiting in other states."

His first patrolling venture was an 800-mi. "closed circuit"—into Illinois along one line, back into Oklahoma over another. He found Stanolind Pipe Line Co. (now Service Pipe Line) and Interstate Oil Pipeline Co. (a Carter Oil affiliate then headquartered in Tulsa) both interested in

DU PONT *Petroleum Chemicals* NEWS

Number 77 in a Series of Bulletins for the Petroleum Industry

JULY 1957

Sludge problems in residual fuels minimized by Du Pont additive

ASSISTANT GENERAL MANAGER . . . ORCHEM

DR. WILLIAM C. KAY is Assistant General Manager of the Organic Chemicals Department of the Du Pont Company.

He started work with Du Pont as an industrial engineer at the Chambers Works in 1934. He became project engineer in 1939, and joined the neoprene manufacturing organization as chief supervisor in 1941.

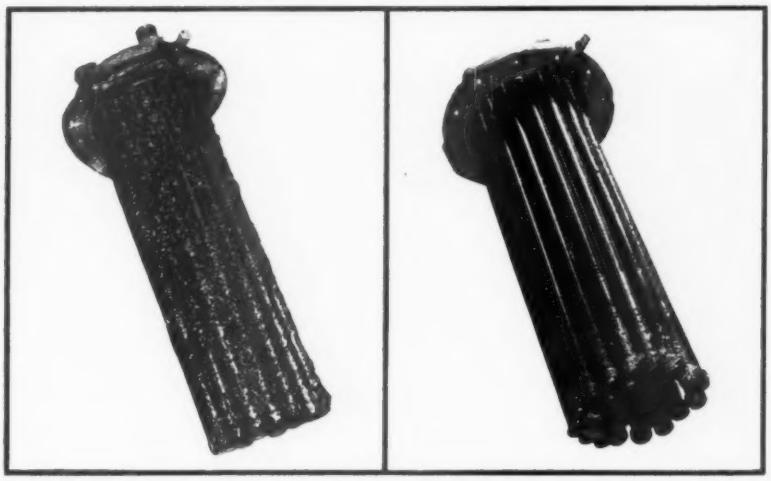
In 1943, Dr. Kay was assigned to the atomic project at Oak Ridge, Tennessee, as production superintendent. From there, he moved to the Hanford Works plutonium project in Washington. He was named Process Manager of the Du Pont Grasselli Chemicals Department in 1947.

Dr. Kay in 1950 joined the Explosives Department as Director of Manufacturing for the Atomic Energy Division. He assumed the same position in the Organic Chemicals Department in 1955. His appointment as Assistant General Manager occurred at the beginning of this year.

Dr. Kay earned his B.S. and Ph.D. degrees, respectively, at the University of Minnesota and M.I.T.

Sludge-packed systems cleaned and KEPT clean

It is, of course, a well-known fact that residual fuels too often cause serious problems. Being the "bottom of the petroleum barrel," they contain, in concentration, all the impurities from the lighter oils which have been distilled off.



PREHEATER TUBE-FOULING . . . solved by FOA-2

TO REVIEW THE PROBLEM . . .

Insoluble sludge is likely to form in residual fuels—in storage, in transit or in use. That, briefly, is problem No. 1.

Problem No. 2: Residual fuels, when blended, are often incompatible. Insoluble sludge is likely to form.

Du Pont Fuel Oil Additive No. 2 solves both problems.

Sludge cure

When sludge forms, trouble starts in the form of clogging. Many times nothing short of costly major "surgery" will start the oil flowing. So tank walls are cut through, sludge is removed mechanically, and the hole is patched up.

Oftentimes it is found that fuel system parts, filters, strainers, nozzles, preheater tubes and shells, have become clogged. While mechanical cleaning sometimes restores their functions, expensive replacements are sometimes necessary.

With these corrective measures going on, *downtime* is mounting, and labor costs are keeping pace.

Many other residual fuel users know that such an operation isn't necessary, that FOA-2 would have cleaned the tanks and parts, restored operation of the system. No cutting into tanks, no cleaning or parts-replacement, no heavy labor expense. Downtime? Greatly reduced.

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT *Petroleum Chemicals* NEWS

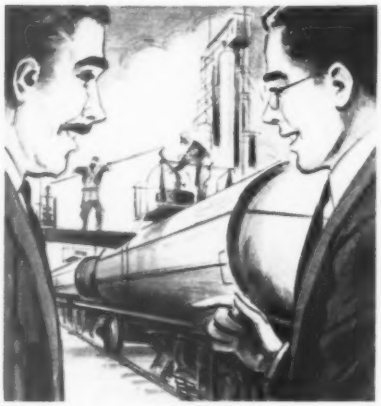
Du Pont is always prepared to meet your emergency TEL needs

REFINERY SUPERINTENDENT:

We're in a jam. Our next regular TEL delivery is not due for another 10 days. But our refinery is gearing up to meet an unexpectedly heavy demand . . . and we don't have enough TEL to do the job.

DU PONT REGIONAL SALES OFFICE MANAGER:

Don't worry about it. We have several tank cars of TEL on a siding only a few miles from here. We can get a couple of cars over first thing in the morning.



REFINERY SUPERINTENDENT:

The TEL cars arrived this morning. That's service . . . less than 24 hours to deliver. It's good to know we can get that kind of service when we need it.

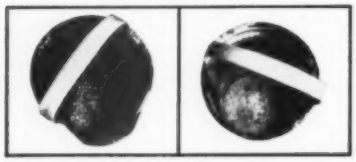
CONTINUED

Sludge problems

How it works

FOA-2 added to residual fuel attacks insoluble sludge, reduces the size of the particles which compose it, suspends them. Thus the fuel flows freely through the system. There is no blockage of nozzles, lines, filters, strainers and other parts. Oil, suspended sludge particles, and the FOA-2 burn completely.

Once a system is cleaned with FOA-2, small amounts of the additive *keep* it clean. That's because FOA-2



STRAINER-PLUGGING . . . solved by FOA-2

is a stabilizer and solubilizer as well as a dispersant.

FOA-2, being nonmetallic, is ashless and leaves no residue after burning.

Case histories prove power of FOA-2

Early this year we assembled in one technical memorandum ten case histories documenting the power of FOA-2 to clean, and to keep clean, systems fueled by "barrel-bottom" residuals.

We believe you will be interested in the ease and economy of using FOA-2, and suggest that you write for Technical Memorandum No. 317, dated January 1957.

NOZZLE-FOULING . . . solved by FOA-2

Director of Petroleum Laboratory Appointed to NACA Subcommittee

Dr. Bernard M. Sturgis, director of the DuPont Company's Petroleum Laboratory, Deepwater Point, N. J., has been appointed to the National Advisory Committee for Aeronautics subcommittee for aircraft fuels.

Subcommittees of the NACA assist in initiating research programs, advising upon technical problems, reviewing current research throughout the nation, recommending new areas of research, and coordinating research programs. NACA objectives are to anticipate the research needs of aviation and to supply the armed forces and industry with basic information for the design and production of aircraft.

DuPont's Petroleum Laboratory devotes a considerable part of its research effort to aircraft fuels and lubricants.

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OVER

A-4801

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seeing how planes would work out for pipeline patrolling.

Romans, too, wanted to see how things would pan out. So he agreed to a six-month trial period. He would patrol a crude line from Drumright to Alton for Stanolind, then return over Interstate's Ajax line to Perryman, Okla. "Within four months," recalls Romans, "Stanolind called me in and asked me to take on more pipelines. I knew then that contract patrolling was going to be a big thing in my life." That was in 1944.

The selling points of his service—speed and economy—were apparent to Romans from the start: Planes can cover a whole pipeline in some cases quicker than a pipe-walker can cross a good-sized cotton field; they can spot trouble quickly, report it quickly, and provide general emergency service in a hurry to the most remote section of a line. Furthermore, the contractor has an advantage over a company-owned plane operation because he can serve more than one company—often with one flight.

As soon as Romans sized up the prospects of pipeline patrolling, he invited the pipeliner friend who tipped him off to enter partnership with him. But the friend backed down.

Today, Romans has a lofty position in the pipeline patrolling business—both literally and figuratively. But he still hustles as hard as ever.

Evidence of his preoccupation with business was a recent auto trip to Los Angeles. He took his wife and two children, promising them a leisurely drive back through the Rockies. ("We went by car because it's easier to make stops for the kids—you know, pick up a hamburger, things like that.") By the time he had got back as far as Denver, however, he was so impatient to tackle his pipeline patrol problems that he grabbed a commercial flight, leaving the family to finish the auto trip without him.

His one hobby, if it can be called that, is a herd of registered Black Angus cattle that he's raising on 160 acres of land that he owns southeast of Tulsa (he has another 80 acres to the east of that farm). He also breeds Palomino horses.

For a time he was Oklahoma distributor for a light-plane manufacturer. But he couldn't find enough "spare" time to keep that sideline, too.

One of his current goals is to figure out some easy way to spot gas line leaks from the air, so he could add gas-line patrolling to his business. "Without being able to sell leak detection," he says, "we can't really sell much gas line patrolling."

How to keep informed on the "with what" part of your business

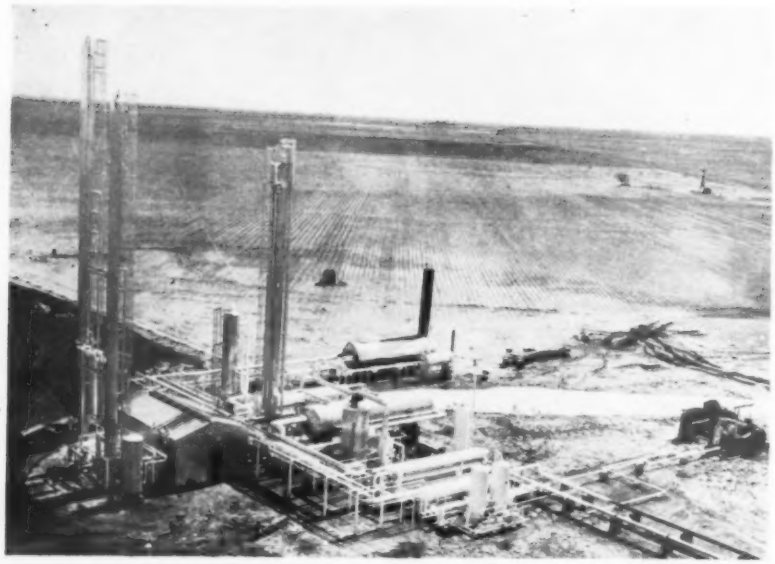
AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information – advertising. You might call it the "with what" type – which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better – save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit *you* and *your* company, he is taking *his* most efficient way toward a sale.

Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

McGRAW-HILL PUBLICATIONS



NEW NATURAL GASOLINE PLANT at Tyrone, Okla., is one of the first large plants to use ammonia-absorption refrigeration in recovering liquid hydrocarbons. It means . . .

Field Absorption Is Increasing

A newly-completed Oklahoma natural gasoline plant—which is producing liquid hydrocarbons almost as by-products—is processing 50-million cu. ft. of gas a day with a new adaptation of an old refrigeration principle: ammonia absorption.

The plant was built at Tyrone, Okla., for Excelsior Oil Corp., an affiliate of Kansas-Nebraska Natural Gas Co., Inc., by the oilfield equipment division of Black, Sivalls & Bryson, Inc.

The plant uses ammonia absorption primarily to control hydrocarbon dewpoint and to lower the BTU and completely dehydrate the gas it processes. Its daily liquid hydrocarbon recovery of about 25,000 gal. is considered only icing on the cake.

At Tyrone, the main concern is making a very lean gas stream which is suitable for the natural-gas-transmission system of the Kansas-Nebraska Pipeline.

The incoming gas at Tyrone is lean, all right: It is made up of 3.05% nitrogen; 86.80% methane; 5.16% ethane; 3.30% propane; and much smaller volume percentages of isobutane, butane, pentanes, and hexanes.

Still, liquid recovery at the plant, at design gas throughput, breaks down to 8,600 gal. of propane, 7,500 gal. of butanes, and 9,650 gal. of natural gasoline daily.

The Tyrone plant is one of the first large natural gasoline plants to use this type of processing.

Here's how it is working:

The gas stream, after losing its entrained water, is chilled to about 22F in a residue-gas-rich gas-heat exchanger. It is then further cooled to zero by expanding high-pressure liquid ammonia in a chiller. The cold gas and accompanying condensed liquid are then segregated in a low-temperature separator.

The cold residue gas is piped out of the plant, while the separated hydrocarbon liquid and a hydrate inhibitor are reheated to about 70F for partial demethanization. On leaving the low-temperature separator, the hydrate inhibitor is discharged to a regenerator, while the liquid hydrocarbon stream heads for additional processing in the plant's fractionating system.

Here, propane, butane, and natural gasoline are separated out.

All process heat for the plant operation is supplied by an indirect salt-bath heater, through which heat-transfer oil is pumped. This picks up heat for the fractionator reboilers; provides heat for the bottom of the low-temperature separator; and heats the control and pump house.

The plant operates at zero deg. F at 850 psig.

The plant is practically self-operating and adjusts itself automatically to any given load over the entire operating range.

The refrigeration system, with a 200-ton capacity, all but controls itself. It has only one moving component, an ammonia liquor pump. The ammonia flow rate from the absorber is controlled by a valve on the supply gas to the pump. The temperature of the ammonia in the chiller is a function of the pressure maintained on it. This pressure can be lowered by speeding up the pumping rate.

The ammonia-absorption type of refrigeration resulted in reduced maintenance costs and increased operating flexibility at Tyrone, according to Black, Sivalls & Bryson.

"Experience at Tyrone," the company says, "has shown that the system is quite versatile from the standpoint of control, having operated at 40% of design as well as at design conditions."

Also, the fuel-gas requirements in this kind of absorption system are proportional to the load; a 50% reduction in load means a 50% reduction in fuel gas required.

Ammonia-absorption systems, attractive cost-wise for larger plants, may well be used on a wider scale in field processing in the future.

BS&B is certainly optimistic about such a possibility. The company points to these advantages of ammonia absorption refrigeration in predicting a more extensive use of the system:

- It has mechanical simplicity. This is especially important in plants like Tyrone, which are situated in sparsely populated areas. Maintenance in such plants must be performed by operators. Since the ammonia liquor pump is the only moving part in such a system, maintenance—and repairs—are not complex problems.
- The absorption system is completely out-of-doors, with no buildings needed to protect equipment.
- Cost of an ammonia-absorption system is attractive in larger sizes, over 100 tons, running less than $400 a ton for heavy-duty, completely automatic low-temperature refrigeration in such sizes.

Compression, refrigeration systems, another choice for field plants, use compressors instead of the ammonia absorber, the strong-ammonia pump, and the ammonia fractionator.

In small plants, some field processors may prefer the compression system. That's because absorption systems have a relatively high initial cost in plants below 50 tons, ranging from $700 to $1,500 per ton.

What's New / IN REFINING

Gasoline Additives Lower Octane Needs

Ethyl Corp. has developed a new antiknock compound which, reportedly, could open the door to widespread gasoline improvement without octane increases.

So far, the compound, tentatively called AK-33X, has been given full-scale testing on aviation engines only. Nevertheless, the findings of these tests, it is felt, may well apply to motor fuels.

One of the most important conclusions of Ethyl's tests on AK-33X is that the compound, when used to supplement tetraethyl lead, lowers an engine's octane requirement. The new compound can also be used without TEL—but with less efficiency.

Ethyl calls AK-33X one of a new class of chemical compounds being investigated by its research laboratories. "Of these," says Ethyl's board chairman, E. L. Shea, "AK-33X—an organic compound of manganese—appears to be the most promising."

Sinclair Refining Co. has just removed the cloak of secrecy from its "X-Chemical" gasoline additive: The mystery ingredient is made up of tributyl phosphines.

Sinclair was issued a patent last week for use of the phosphorous additive in premium gasoline. The patent, says Sinclair, "recognizes that the use of tributyl phosphines in gasoline containing tetraethyl lead significantly reduces preignition and spark plug fouling, and decreases the octane requirement of cars using it."

Sinclair has been using the additive since August of last year (PW—Aug. 24'56,p32). It is now ready to license the use of the material in foreign countries.

•

Foster Wheeler Corp. has an iron in the fire to build a 15,000 b/d refinery in Thailand.

Foster Wheeler, in association with Summit Industrial Corp., has submitted one of three bids for construction of the refinery being studied by the Thai government. The plant, which would be built on Bangkok Harbor, would produce a full line of products —except for lube oils and avgas— for sale to the Thai military. It would probably run on Middle East crude.

Two other, smaller, plants are also under consideration for Thailand. One is a 1,000 b/d topping plant which would be built inland near recently discovered production fields. Several sites are being discussed for the other, which would have a probable capacity of 5,000 b/d.

•

The Cooperative Refinery Assn. will build a hydrofluoric alkylation unit at its Coffeyville (Kan.) refinery.

The Refinery Engineering Co. of Tulsa, a division of Vitro Corp. of America, will build the unit under license from Universal Oil Products Co. Construction will begin in September, and completion date is set for early 1958.

Howard A. Cowden, president of the association, calls the $1-million cost of the unit "the price of keeping modern in a period of rapid changes in the petroleum industry."

•

Canadian Industries Ltd. will double the capacity of its Edmonton (Alta.) polyethylene plant. Construction to raise the plant's capacity to 40-million lb. a year will begin later this year.

The expansion will mean that the Edmonton plant will process additional Alberta natural gas. The plant extracts ethane from the gas and converts it to ethylene, which is the feedstock for polyethylene.

•

Union Oil Co. of California has consolidated two of its subsidiaries, Brea Chemicals, Inc., and R. T. Collier Corp.

Brea manufactures petrochemicals; Collier has interests in the carbon and allied fields.

The new corporation, to be known as Collier Carbon & Chemical Corp., will manufacture and market Brea brand chemicals in one corporate division, and operate its carbon businesses in another.

•

A new, up-to-date compilation of U.S. and Canadian refineries is now available. Petroleum Processing, a McGraw-Hill publication, has prepared the list, with a keyed map of refinery sites. The listing includes all plants and refineries operating, building, planned, and even shutdown.

on stream in Germany

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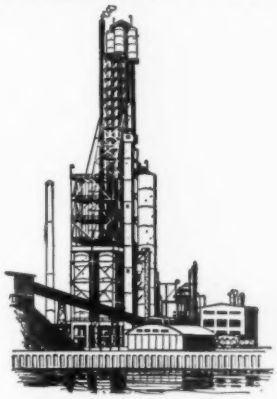

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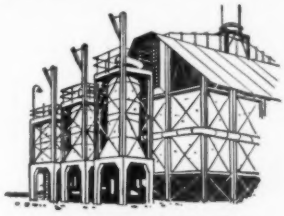

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DEALER COUNCILS are aimed at getting station men talking freely to management. This is how . . .

Sinclair Feels Its Dealers' Pulse

Sinclair Refining Co. asked for it: a straight-from-the-shoulder opinion from station dealers on their needs and problems. Now the answer is back in area reports from 50 dealer councils. The lessons: Keep pushing dealer training—station men want it. Keep listening.

Like other supplying companies, Sinclair is finding that such frank talks pay off in better supplier-dealer relations and contribute fresh ideas for new marketing policies.

Shell Oil Co. and Esso Standard Oil Co. are heading in the same direction (PW—May17'57,p37). Shell holds dealer conferences on the divisional and regional levels to keep in touch with dealer thinking. Esso recently formalized its dealer and jobber meetings from top to bottom.

Gulf Oil Corp. has divisional "grass roots" committees, which meet with dealers, and a special committee on dealer relations to act on suggestions and problems presented by dealers (PW—Jan.25'57,p48).

Nearly 700 Sinclair dealers met in groups of 15 or less for the area councils. The sole purpose of the two-day meetings is to get the dealers talking freely. Sinclair has been developing its council idea for nearly two years. It first held councils on the national level, then at the district level. These meetings were so successful that the program was extended.

The area managers invite a cross-section of dealers to attend the councils at company expense.

Some dealers, at first, were a bit hesitant and skeptical about the meetings. They responded to invitations with such questions as:

"Are they really sincere in asking my opinion? What will they ask me? What will they let me say?"

Sinclair people get the discussions rolling by using visual aids, and by asking the dealers: "What do you think of Sinclair's way of doing such-and-such? How can we do better? Who has some better ideas?"

"The dealers are a little bit tense at first," says one district manager, "but once they accept the council idea, the climate is such that they talk freely."

Here are some of the high points of the meetings:

Although dealers in general favor Sinclair's extensive dealer sales aids, they'd also like to get more practical assistance.

They'd like to see the sales representative more often, but he usually doesn't have enough time to give each dealer proper attention.

"I'd like to see a service representative—someone who can spend a couple of hours showing me," says one dealer.

The sales representative could do a lot to help the newer dealers, by alerting them to the pitfalls that they may run into, it was pointed out.

Dealers gave a stamp of approval to Sinclair's training program. They asked for more product information and in-the-station training for themselves and their employees.

They said that they wanted the Sinclair dealer conferences (instructive sessions with the company doing most of the talking) repeated—with more information on products, accounting, and minimum wage laws.

Some dealers suggested that future training sessions be held at stations, so that employes are included.

In most of the councils, two serious problems kept popping to the surface: getting good help, and carrying personal credit.

"The problem of getting and keeping good help is so darn serious," says a company marketing man. "Especially when dealers are competing with industries that offer higher salaries and shorter hours. A dealer gets discouraged when he's got to do all the work himself.

Most dealers feel that some sort of incentive or commission plan for employees is a must. They want Sinclair to prepare a booklet on incentive plans.

Sinclair—and the oil industry—should do something about raising the prestige of the service station business, say dealers. They want to see the business promoted in high schools, to help attract better employees.

Carrying personal credit seems to plague a lot of dealers, especially when

they're first getting started. One area report concluded: "Carrying personal credit is the one biggest problem to the dealer today."

Sinclair discovered that its dealers think the company's credit card and bookkeeping systems need to be improved.

"Many times we turn in applications three or four times before we get results," says one dealer.

Sinclair also found out that some dealers hadn't even heard of the company's improved self-mailer application.

There's a lot of note-comparing by dealers at the councils—on how to become better businessmen, and on new merchandising methods.

"The dealers know what they lack," says a Sinclair spokesman, "and they want help in correcting these things."

The dealers say they want to learn how to do a better selling job on related lubrication services. They want more meetings with car service departments—especially on motor oil and grease.

Sinclair should put more "teeth" into its clean-restroom program, say dealers, because one dealer can ruin the business for many others.

"If a restroom is dirty, the dealer should have the 'clean restroom' sign removed," said one dealer.

"Remove the dealer, not the sign," countered another.

Sinclair is already putting some of the dealers' suggestions to work. For example, dealers said they'd be in a more competitive position if the company put brake fluid in 12-oz. cans, instead of just 16-oz. cans. So now Sinclair plans to sell both sizes.

Study groups are considering other dealer suggestions.

At one council, one of the dealers took the other dealers over to his station that night after the meeting. They went through the station, rehashing the problems and ideas discussed earlier.

Both the dealers and Sinclair field men are enthusiastic about the success of the councils.

Seven district councils will be held in the fall, with one or two dealers from each area council attending.

Many dealers said that the council was the best dealer meeting they'd attended, and asked that next year other dealers be invited.

"The dealer council is the answer to most of our dealer problems," says one district sales promotion manager. "The amount of valuable information we secured almost staggers us. And the dealers can't get over how much good it did them."

What's New / IN MARKETING

About 6,000 Chicago-area station employees, represented by Teamsters Union Local 705, have signed a new wage contract after several weeks of negotiation (PW—Jun.21'57,p54).

The two-year contract with the Gasoline Retailers Assn. of Metropolitan Chicago grants a 12¢-an-hour increase retroactive to Apr. 30, and a 10¢-an-hour raise starting Apr. 30, 1958. Employees originally asked for a 25¢ increase and a new one-year contract. A union spokesman said that a 40-hour week will be a must in any future negotiations.

•

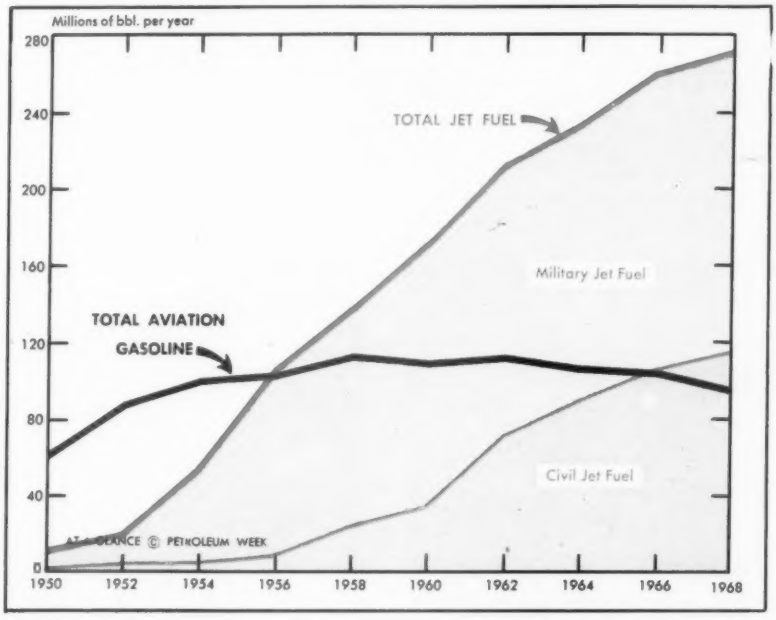
Tidewater Oil Co. continues to acquire new outlets: Last week it bought the assets of one of its distributors, James A. Clappison, Inc., of Bath, Me. The firm becomes a Tidewater consignment distributor in Bath and Brunswick, Me. Tidewater—which has been one of Clappison's two suppliers—acquired 24 gasoline outlets, bulk plant facilities, and an undeveloped tract of land.

•

Sinclair Refining Co. is revamping its marketing department according to its three basic types of customer: retail, consumer, and wholesale. Each segment will have a general manager under L. W. Leath, vice-president and general sales manager. The company increased its home office staff by appointing L. J. Hoar as assistant general sales manager, and W. D. Cross as regional manager for liaison with Midwest, Southwest, and Rocky Mountain divisions.

•

D-X Sunray Oil Co. is rallying the support of employees in pushing the sale of its new DX-Boron motor fuel (PW—Apr.12'57,p70). Prizes will go to the employees who introduce the new gasoline to the most customers.

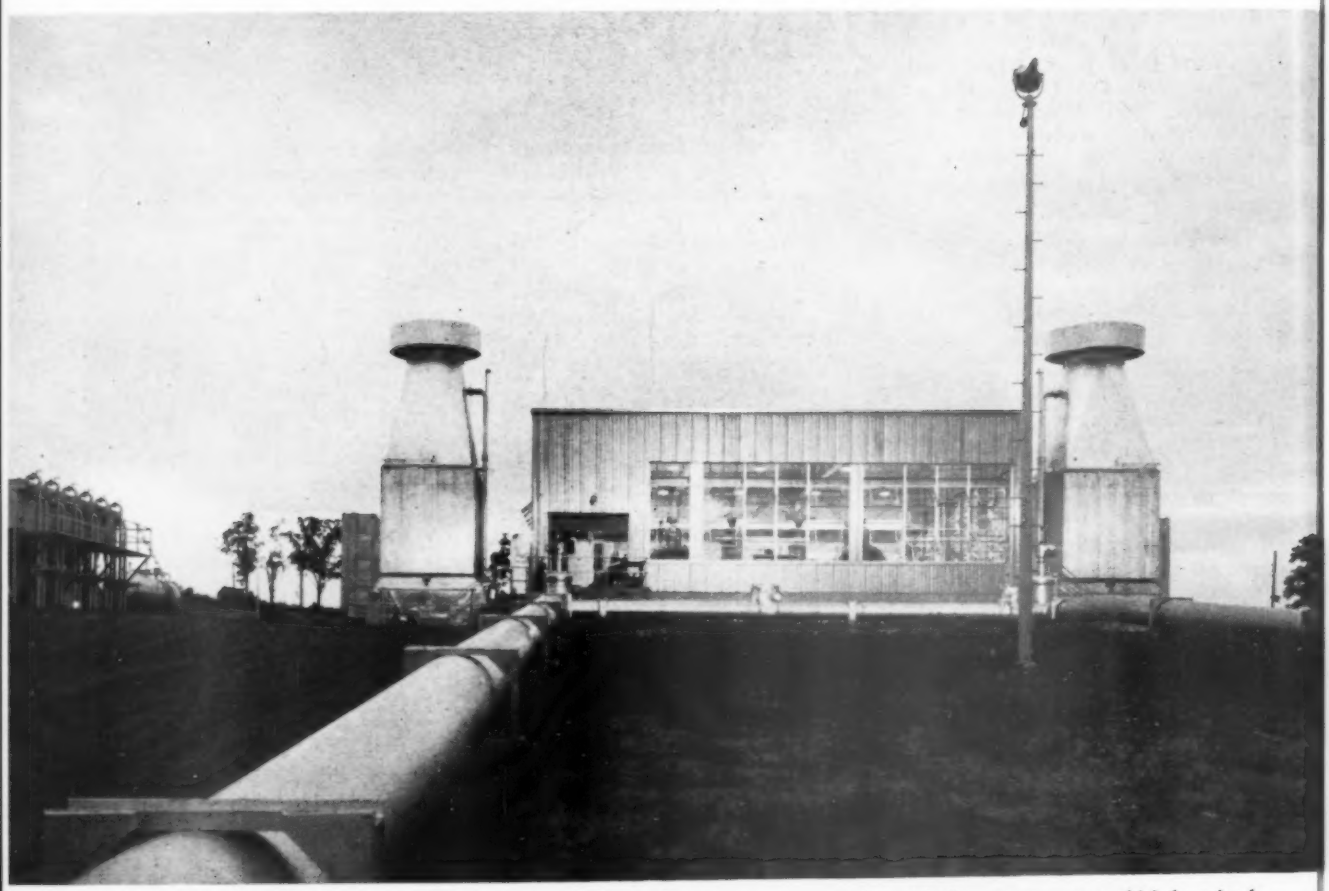


Jet Fuel Demand Passes Avgas

Worldwide demand for aircraft jet fuel is now higher than that for aviation gasoline, according to a study by California Texas Oil Co. Future worldwide demand, charted by Caltex (above), puts jet fuel at about 275-million bbl. in 1968, with nearly 120-million bbl. earmarked for civil use.

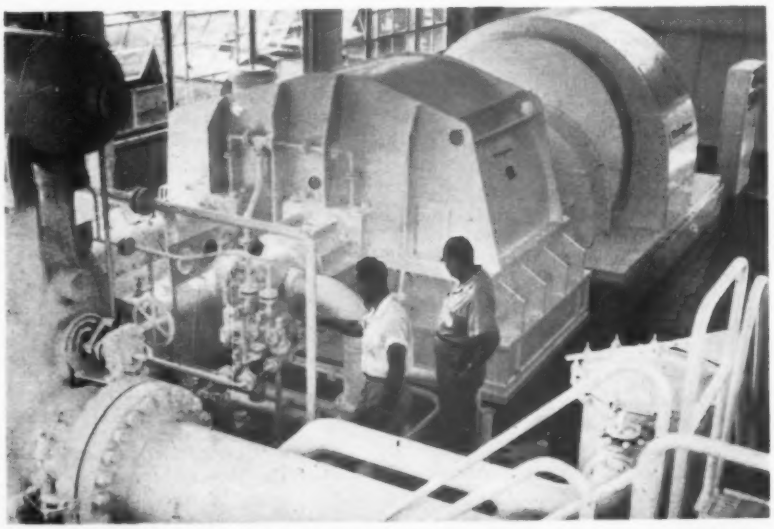
Caltex predicts that avgas demand will hit a peak of some 110-million bbl. in 1958, level off, and then decline gradually—to about 95-million bbl. in 1968.

Texas Eastern's New Gas Trunk Ha



TURBINE EFFICIENCY is obtained at Texas Eastern's Athens (Ohio) compressor station with these regenerators, which heat intake air, cut fuel costs. Low foundation was made possible by arranging ductwork to side, rather than beneath turbines.

SURGE CONTROL unit recycles gas back into compressor when necessary.



GIANT ELECTRIC MOTOR at Mt. Pleasant, Tenn., is one of three such 15,000-hp. prime movers on Kosciusko line. They're the largest electric motors on any pipeline.

Ha Unique Engineering Features

Texas Eastern Transmission Corp.'s 30-in. "Kosciusko" line, about to become the company's biggest natural gas trunk, has been the proving ground for several engineering advances.

Texas Eastern got its start in 1947 by buying the war-built Big Inch and Little Inch trunks from the government for $143-million. These lines, running from Texas to New Jersey, were converted to gas arteries.

In 1952, the company started building another major gas trunk, from Kosciusko, Miss., to Uniontown, Pa. Since then, this line has been extended southward to Vidor, Tex., where it connects to still newer gathering facilities that stretch down to the Mexican border (PW—Oct.19'56,p36).

This fall, Texas Eastern is reconverting most of the Little Inch to its original function—product hauling (PW—Jun.28'57,p37). The Kosciusko line is being expanded to take over the Little Inch's gas capacity. By that time, the company will also have completed additional expansion programs that will have boosted the Kosciusko line's transmission capacity to more than 1-billion cu. ft. daily.

And Texas Eastern is proud of new engineering principles that have been developed along with the line.

One piece of equipment that has gained new stature in the Kosciusko line is the centrifugal compressor. Actually, Texas Eastern pioneered use of the centrifugal compressor for gas transmission solely because it had bought a lot of electric-drive pumping stations along with the Big and Little Inch lines.

These stations consisted of electric motors coupled to centrifugal compressors—the latter adequate for pumping oil but too slow and too small for compressing gas. Every time the company tried to figure out how to salvage the fixed-speed motors, it came back to the same conclusion: Hook them to bigger, faster centrifugal compressors.

By the time the company started building its own line in 1952, it had 15 centrifugal compressor stations on the Big Inch and Little Inch. By this time, also, the company was sold on the principle of centrifugal compressors for all stations that could be operated at a fairly constant load factor.

Along with the development of bigger compressors, Texas Eastern has turned to bigger prime-movers—putting more and more of its horsepower requirements into fewer units. For example, one of the early stations on the Kosciusko line, at Gladeville, Tenn., uses six motors and six compressors to develop 15,000 hp.

The company is proud of this station. Many innovations and improvements were developed at this stage of the system. Among them was the first use of adjustable inlet guide vanes on the compressors. By switching the angle at which the gas stream strikes the compressor impellers, the amount of compression is changed—which enables the company to get adjustable compression rates from fixed-speed motors.

Also, Texas Eastern first adopted "air-to-oil" coolers in the lube and seal system at this station. And it installed forced-draft ventilated motors, eliminating the usual firewall.

But, although Gladeville cost the company only $168.50 per installed horsepower, Texas Eastern figured it could reduce initial cost still further by consolidating the horsepower into fewer units. Operating and maintenance costs could also be reduced, with fewer units to wear and require watching. And the simpler the installation, the easier it would be, eventually, to adapt a station to remote control.

Today, the company has three stations on the Kosciusko line in each of which there is only one giant electric motor driving a giant centrifugal compressor. One such station is at Mt. Pleasant, Tenn. (picture, bottom right, page 48). The others are at Egypt, Miss., and Tompkinsville, Ky.

The motors are 15,000-hp., synchronous, three-phase, 60-cycle motors, built specially for Texas Eastern by Westinghouse Electric Corp. They're the biggest electric motors on any pipeline. Westinghouse also supplied the speed increasers, which convert motor speed of 900 rpm. to compressor speed of 6,500 rpm.

The compressors are single-stage, single-suction units, made by DeLaval Steam Turbine Co. They have the highest compression ratios of any single-stage centrifugal compressors—1.5:1. They take in gas at about 630 psi. and discharge it at more than 950 psi.

These stations cost a mere $114.04 per installed horsepower, compared with costs of more than $200 per installed horsepower at other types of stations.

One of the ways that consolidating horsepower cuts initial cost is that it cuts down the amount of building and foundation space required. Another cost-cut was the arrangement of "across-the-line" starting, which simplified switchgear. The company figures it saved $75,000 of initial cost at each station. The arrangement, which means that the motor starts at full load rather than at reduced voltage, was helped by the fact that 161-kv. power lines were near each station site.

Operating costs are low, too—the stations are in Tennessee Valley Authority territory, where electricity is cheap. Also contributing to the operating economy of such single-unit stations is the fact that fewer spare parts must be kept on hand.

Giant gas turbines are another form of prime-mover that have been proved practical on the Kosciusko line. Texas Eastern has two 7,600-hp., two-shaft, open-cycle General Electric Co. gas turbines at a station outside Athens, Ohio. Again, these units are the biggest of their type in gas transmission.

The turbines are equipped with regenerators (top picture, page 48), manufactured by Air Preheater Corp. These are simply heat exchangers, which draw heat from the turbine's exhaust and raise the temperature of air that's being drawn into the combustion chamber. This cuts fuel consumption.

The 7,600-hp. single-stage, single-suction centrifugal compressors were built by Clark Bros.

The turbines were picked because, as in the electric station, Texas Eastern was interested in big prime movers, to turn big centrifugal compressors—at a fairly constant load factor whenever the station was in service.

In this area, the economics favored gas for fuel, rather than electricity. And Texas Eastern says its couldn't get a 15,000-hp. turbine that would be as efficient as the two "smaller" ones.

Initial cost of the turbine station was $199.11 per installed horsepower, which might have been higher if Texas Eastern hadn't put in a couple of design twists.

For one thing, the turbine exhaust

stacks are turned downward and led along the side to the regenerators, giving maximum access and ready maintenance to the turbines. This also permitted a low, simpler foundation than the ones required when ductwork is channeled beneath the machines.

Another twist was "straight-through" piping between the compressors. Usually, the piping between compressors is looped, to take up expansion as the gas, which picks up heat in one compressor, travels through the pipe to another. These expansion loops are not only expensive, but they also waste pressure.

Texas Eastern decided the loops were unnecessary. The company says that, after operating two winters and one summer with the straight-through system, it's convinced that the decision was right.

The company is planning to have a total of nine 15,000-hp. turbine stations in its system when the present expansion program is completed.

To guard against surge action at the centrifugal stations, Texas Eastern has worked out a control system which channels gas from the discharge side of the compressor back to the suction side. Surging, which can set up damaging vibrations in a line, can occur at start-ups, stops, or whenever a whirling compressor becomes momentarily "starved" for gas. Most stations are equipped to insure smooth start-ups. But Texas Eastern was interested in preventing operating-period surges.

The company studied the flow characteristics that preceded surging, then equipped some of its stations with detectors to spot such conditions. A control box in the station (picture, bottom left, page 48) affords either automatic or manual operation of the recycling valves on the station bypass line. The control system will also facilitate eventual remote operation of the stations.

A large, underground storage field near the marketing end of its system is a key factor in enabling Texas Eastern to concentrate on large, centrifugal units.

A 30-in. spur from Uniontown leads to Oakford Field, in western Pennsylvania. This spur taps the Kosciusko line, the Big Inch, and Little Inch. And all lines and the field are interconnected with the Texas Eastern-Penn-Jersey line.

The field, owned jointly by Texas Eastern and New York State Natural Gas Corp., has already held up to 105-billion cu. ft. of gas. And Texas Eastern is studying the possibility of putting in even more.

Thus, the company has been able to design the Kosciusko line for fairly constant, high-load operation. If the line isn't moving gas to market, it's moving it to storage.

Furthermore, having the storage at the marketing end has minimized the effect of a possible station breakdown. The company can put all of a station's horsepower requirements into one package. And even if a 15,000-hp. "package" were to break down in a peak-demand period, reducing the line flow by as much as 10%, deliveries could continue, uninterrupted, from storage.

What's New / IN TRANSPORTATION

The government has started to remothball the tankers taken out of the reserve fleet for the Suez crisis—a move designed to take some of the sloppiness out of the tanker-rate situation.

The Military Sea Transportation Service was reported last week to have slated six T-2s for immediate return to the reserve fleet as current voyages are completed. Most of the 49 tankers reactivated last summer and fall are expected to be out of service by the end of the year.

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Westcoast Transmission Co. now expects to complete its new gas trunk from the Peace River area of Canada to the U.S. border by August—at least two months ahead of schedule.

The company says the line is now about 85% complete. Westcoast will connect with the Pacific Northwest system at a point near Sumas, Wash.

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Complete looping of Pacific Gas & Electric Co.'s "Super Inch" from Topock, Ariz., to San Francisco Bay is now under contract.

Pacific has been letting out contracts calling for looping of the entire 502-mi., 34-in. link to the El Paso Natural Gas Co. system. The final loop contract was awarded last week to Engineers Limited Pipeline Co., of San Francisco. For $15-million, the contractor will build a 138-mi. section before the end of the year. This will boost capacity of the line to 950-million cu. ft. daily.

New compressor horsepower being installed this year and next will hike the capacity to slightly more than 1-billion cu. ft. daily.

•

Southern California Edison Co. is lining up the right of way for a $24-million, 130-mi. gas line from the San Joaquin Valley to the Los Angeles harbor area.

Completion is expected early next year. Edison Securities Co., a subsidiary, will build the line. The company has signed a 20-year contract for "several million" cu. ft. of gas daily with Richfield Oil Corp.

The gas is slated for use as fuel in Southern California Edison's electric-generating plants. The company is budgeting more than $300-million for new construction this year and in 1958.

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BP Tanker Co. has ordered 26 new tankers, including seven of 65,000 deadweight tons, nine 50,000-tonners, and five 34,500-tonners. Two of the latter may be upgraded to 50,000-tonners when construction starts. The remaining five will be of 15,500 tons.

The vessels will be built in British yards, for delivery in 1960-63. BP Tanker Co. is a subsidiary of British Petroleum Co.

British Petroleum and its subsidiaries now have 147 ocean-going tankers totaling more than 2-million tons, plus orders placed last year for 37 new ships totaling 1,150,000 tons.

•

A Japanese firm expects to start importing liquefied natural gas this year. Tokyo Gas Co. has worked out a deal with Mitsubishi Trading Company, whereby Mitsubishi will buy gas from Borneo, Sumatra, and other Southeast Asian countries, and from Iran. The gas will be liquefied and transported in a special tanker, according to reports from Tokyo.

The liquefied gas reportedly will retail at half the price of present manufactured gas—and also conserve Japan's coal imports and the foreign currency used for coal imports.

DEPT/Personals

CHADWICK H. CARPENTER has been appointed to the newly created post of executive assistant to the president of Standard Oil Co. (N. J.). With Jersey Standard since 1937, he has served both as secretary of the executive committee and as assistant secretary of the company.

C. H. Carpenter

K. H. Beekhuis

KAREL H. BEEKHUIS has been elected president of Aramco Overseas Co., wholly-owned subsidiary of Arabian American Oil Co., with headquarters in The Hague, Holland. Prior to the promotion, he had been executive vice-president of the company.

MARSHALL C. COLEMAN has been made zone production manager of Gulf Oil Corp., in Laurel, Miss., succeeding **Harry S. Brigham.** Coleman has been assistant zone manager since June, 1956. **Paul Hopson** transfers from the Billings (Mont.) area office to Gulf's division office in Denver as a geologist.

HARRY S. BRIGHAM has joined Dixilyn Drilling Corp., Odessa, Tex., as executive vice-president. He recently resigned from Gulf Oil Corp., as zone manager of production for the Laurel (Miss.) area.

FRANK L. GRIMM, president of O'Boyle Tank Lines, Washington, D. C., is the 1957-58 president of National Tank Truck Carriers, Inc. Other newly elected officers are **Lester A. Wilsey,** president of Indianhead Truck Line, Inc., St. Paul, Minn., first vice-president; **L. A. Odom,** board chairman of Associated Petroleum Carriers, Inc., Spartanburg, S. C., eastern vice-president; and **Owen M. Collett,** vice-president of the Tanker Division, Pacific Intermountain Express Co., Oakland, Calif., western vice-president. All other officers have been reelected.

ROBERT P. GRIGGS, JR., Tidewater Oil Co. geologist at Lafayette, La., is being transferred in a similar capacity to New Orleans in charge of the area office.

BOB G. WALKER and **RALPH E. DIAL** have been made district landmen of the newly divided Oklahoma and Kansas districts of Midstates Oil Corp. Walker will have charge of the Oklahoma district, Dial the Kansas district. Both will continue to be in Oklahoma City.

H. R. WALL has been promoted to the new position of general manager of Continental Oil Co.'s transportation and supplies department, in Houston. He will assume responsibilities formerly held by the recently promoted **T. A. van Griethuysen,** except for purchasing operations. **James Finley** is being transferred to Houston as assistant to the geophysical manager. He was formerly division manager for Conoco at Midland, Tex. **R. B. Haynie,** formerly a geologist in Egypt with Sahara Petroleum Co., is rejoining the company at Midland. **D. W. Devaney** is the new director of training for Conoco's manufacturing department, in Houston. He succeeds **G. F. Bassler,** recently named director of personnel development in the industrial relations department. Prior to joining Conoco, Devaney had been coordinator of communications and training for Cit-Con Oil Corp., Lake Charles, La.

J. O. TROTTER, JR., will manage the marketing division of Hess Terminal Corp., Houston. He formerly managed supply and distribution for Texas City Refining, Inc.

TIDEWATER OIL CO. has appointed three new area engineers in the company's central division production department. They are **R. N. Miller,** from Drumright, Okla. to Hobbs, N. M.; **W. H. McPhail,** from Sallyards, Kan., to Drumright; and **C. J. Stumhoffer,** from field engineer to area engineer at Sallyards.

A. S. GILLIAM is the newly elected vice-president of Great Northern Oil Co. He will continue to serve as plant manager of the company's Pine Bend (Minn.) refinery. Gilliam was an executive of Olin-Mathieson Chemical Corp. prior to joining Great Northern late in 1956.

J. E. KENDALL has been appointed vice-president in charge of land, geological, and exploration operations for Blanco Oil Co., San Antonio. He has been southeast regional manager in the land and geological department of Phillips Petroleum Co., Bartlesville, Okla.

J. E. Kendall

D. O. Swan

DONALD O. SWAN has been appointed assistant general manager of Esso Standard Oil Co.'s manufacturing department, in New York. **Robert K. Dix** succeeds Swan as assistant general manager of the company's Baton Rouge (La.) refinery. Dix had been operating superintendent of the refinery prior to the promotion.

J. R. HURLEY will assume duties as crude oil representative in exploration and production for Shell Oil Co. in Calgary, Canada. He succeeds **R. L. Hope,** who, after a period of training in California, will assume Hurley's position as assistant to the supplies manager in Shell's New York office. **L. E. McGongile,** manager of the company's San Francisco products department, will temporarily take over Hurley's duties in New York.

HARRY JACOBS, recently retired from Shell Oil Co., has joined Hess Petroleum Corp. as vice-president, with headquarters in New York.

WILLIAM A. SKEES is transferring to Corpus Christi as district geologist for Pan American Petroleum Corp. For the past 2½ years he has been area geologist in Midland.

R. W. French, Jr.

R. W. Edmund

RUDY W. EDMUND has been made acting general manager of Standard Oil Co. (Ohio)'s production department, following the resignation of **RICHARD W. FRENCH, JR.** French, who was vice-president and general manager of Sohio's production department, has joined United Carbon Co., Charleston, W. Va., as president. Edmund, assistant general manager of production for Sohio since July, 1956, will remain in Oklahoma City.

GEORGE ADAMS has been named operations assistant to the vice-president in charge of manufacturing for D-X Sunray Oil Co., Tulsa. He was with Universal Oil Products Co. for eight years before joining D-X Sunray. In the new position, Adams will assist in the operations of the company's West Tulsa and Sunray Village refineries.

J. E. MARTIN, manager of distributor sales for D-X Sunray Oil Co.'s Chicago division, is the new chairman of the Illinois Petroleum Industries Committee. This committee is part of API's American Petroleum Industries Committee.

ROBERT E. PRESTON assumes the newly created post of assistant general manager of division sales for Standard Oil Co. (Ohio), in Cleveland. He will be succeeded by **Salem A. Hart, Jr.,** as manager of consumer sales in home office marketing. Hart was formerly manager of consumer sales for the Cleveland sales division.

JAMES E. FITCH, a recent graduate, has joined the engineering division at Humble Oil & Refining Co.'s Baytown (Tex.) refinery.

L. T. White

T. DeBow

L. T. WHITE and **TOM DeBOW** are newly elected vice-presidents of Cities Service Petroleum, Inc., New York, a member company of the Cities Service system. DeBow has also been made a director, a position White has held since 1938. Both men are veteran executives of the company: White manages the department of business research and education of Cities Service Petroleum; DeBow directs advertising and news for Cities Service Co., the parent.

J. R. WEAVER has joined Forster Drilling Co., of Odessa, as drilling superintendent. He had formerly held a similar position with L. H. & S. A. Olson Drilling Co., of Midland.

EDMUND M. FOO has joined Trans-Canada Pipe Lines Ltd. in Calgary as gas engineer in the gas supply department. He was formerly assistant gas engineer for the Alberta conservation board.

PETROLEUM CORP. OF AMERICA has been formed at Denver to carry on varied oil activities throughout the Rocky Mountain area. **Alfred R. Thomas** is president, **Ed O'Hara** executive vice-president, and **Leo W. Kennedy** secretary of the new firm.

GABRIEL DOHY has been appointed district production engineer in Calgary for Canada-Cities Service Petroleum Corp.

TOM CLIFTON is the new land manager for the Houston office of Lion Oil Co. He was formerly division landman for the company in Denver.

HOWARD LORENZ has opened a geological consulting office in Billings, Mont. He was formerly on the staff of Gulf Oil Corp. in Billings.

GORDON R. HINZ has joined Commonwealth Oil Co., Houston, as a geologist. He was formerly a consulting petroleum geologist in Houston.

CHARLES A. VOSE has been elected a director of Champlin Oil & Refining Co., Ft. Worth. He is president of the First National Bank of Oklahoma City.

KENNETH E. MANNER is the newly appointed assistant secretary of Cities Service Gas Co., in Oklahoma City. He joined the company recently as an assistant to the secretary.

FRED W. MACFARLINE has joined Vickers Petroleum Co. as chief refinery engineer in the company's Potwin (Kan.) refinery. He was formerly maintenance supervisor for Great Northern Oil Co., St. Paul, Minn. **Raymond S. Gibson** has been promoted to the newly created post of senior process engineer, at Potwin. He has been on the refinery staff since 1951.

GARY A. DEAN and **A. A. DEAN** have formed Capitol Oil Co., with headquarters in Oklahoma City.

R. O. VAN FLEET has been elected vice-president of Blanco Oil Co., San Antonio. Van Fleet, formerly production manager, will continue to head the engineering and production departments.

HERMAN G. GUNTER is a new vice-president of Commerce Oil Refining Corp., New York. He was formerly vice-president in charge of refining for Suntide Refining Co., Corpus Christi.

CHARLES M. COLE, JR., is the new chief engineer for Tuloma Gas Products Co., Tulsa marketer of LP-gas products. Since 1956, he had been senior mechanical engineer for the company. The position of chief engineer is newly created to supervise construction and operation of Tuloma's product storage installations, truck terminals, and other supply facilities.

THE OIL ADVISORY COMMITTEE for the State of Kansas has been appointed by Governor George Docking. They are **Robert L. Williams,** Imperial Petroleum Co., Wichita; **Oliver Brown,** Liberal; **Harold Wamsley,** Hutchinson; **Chris Scheedy, Jr.,** Yates Center; **George Peterschmidt,** El Dorado Refining Co., El Dorado; **Charles Byers,** Great Bend; **Thomas H. Allan** and **Glenn Dunne, Sr.,** Wichita; and **Jerry Driscoll,** Russell. As previously reported, **J. A. Vickers,** president of Vickers Petroleum Co., is committee chairman. The committee will investigate all operational problems affecting the oil industry in Kansas and make recommendations to the governor to solve these problems.

ARTHUR R. ERICKSON will manage exploration for Northern Natural Gas Producing Co., a wholly-owned subsidiary of Northern Natural Gas Co., Omaha, Neb. He was formerly chief geologist for the company.

A. R. Erickson

A. E. Woerheide, Jr.

A. E. WOERHEIDE, JR., has joined Stekoll Petroleum Co., Dallas, as chief engineer. Since 1952, he has been vice-president in charge of production and drilling for Byrd Oil Co.

J. W. MILLER is the newly appointed assistant to the president of Union Oil Co. of California. Prior to the appointment, he was serving as executive vice-president of Brea Chemicals, Inc., a wholly-owned Union Oil subsidiary.

THE NATIONAL OIL SCOUTS & LANDMEN'S ASSN. has elected new officers for 1957-58. They are (l. to r., front row), **C. R. Kelly,** Sun Oil Co., Bismarck, N. D., third vice-president; **Walter B. Holly,** Lion Oil Co., Shreveport, La., first vice-president; **George Echols,** Standard Oil Co. of Texas, Tyler, president; **J. B. Johnson,** Sohio Oil Co., Tulsa, second vice-president; **George Ross,** Humble Oil Co., Roswell, N. M., editor-in-chief; and **Dan B. Green,** Magnolia Petroleum Co., Mt. Vernon, Ill., secretary-treasurer. Outgoing officers are (l.to r., back row), **Buck Harris,** Murphy Corp., Wichita, Kan., third vice-president; **F. W. Woods, Sr.,** Atlantic Refining Co., Midland, Tex., first vice-president; **Kelly Scott,** Superior Oil Co., McAllen, Tex., president; **A. T. Murphy,** Shell Oil Co., Denver, second vice-president; **T. H. Robinson,** Phillips Petroleum Co., Evansville, Ind., editor-in-chief; and **Dan Ottenger,** Pan American Petroleum Co., Lake Charles, La., secretary-treasurer.

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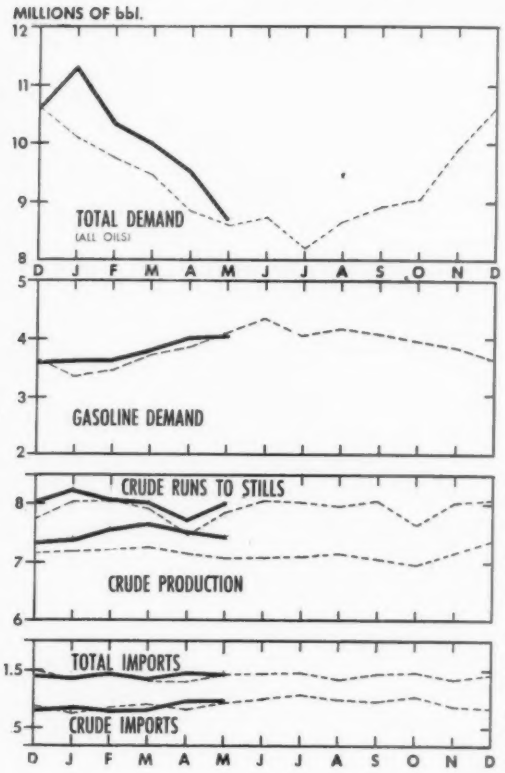
PETROLEUM WEEK'S

Fingertip Figures



Supply-Demand Figures for June

(millions of b/d)

	June, 1957	% Change from year ago	6 months 1957	% Change from year ago
Total Demand (Inc. Exports)	8.770	+ 0.3	9.778	+5.8
Gasoline	4.306	— 0.5	3.889	+1.5
Distillates (Inc. Kerosine)	1.264	— 5.2	2.349	+4.3
Residual	1.450	+ 2.7	1.733	+2.2
Total Supply	9.576	+ 3.1	9.828	+5.1
Domestic Crude	7.190	+ 1.3	7.526	+5.0
Nat. Gas Liquids	.800	+ 5.1	.824	+5.1
Total Domestic	7.990	+ 1.6	8.350	+5.0
Crude Imports	1.132	+14.7	.908	+2.3
Total Imports	1.586	+11.3	1.478	+5.3

RUNS TO STILLS
Latest week 7.915
Previous week 7.859
Year ago 8.144

CRUDE PRODUCTION
Latest week 7.190
Previous week 7.238
Year ago 7.034

TOTAL IMPORTS
Latest week 1.784
Previous week 1.353
Year ago 1.246

CRUDE IMPORTS
Latest week 1.221
Previous week .964
Year ago .871

Total demand in the first half of 1957 averaged 9,778,000 b/d, 5.8% ahead of last year, but about 134,000 b/d below the most recent industry estimates.

That's the indication from preliminary data available this week.

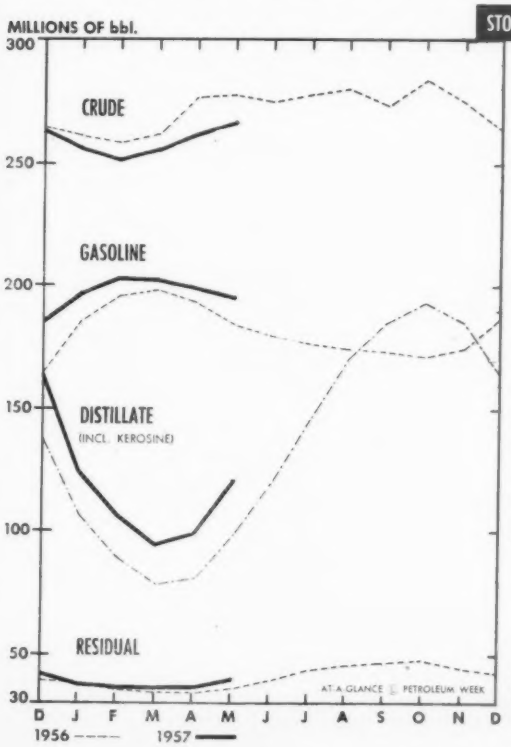
Demand for all of the major products showed only modest gains over last year. The big gain (23.3%) was recorded for minor products plus exports of crude to Europe during the winter quarter.

And while demand ran below expectations, so did total new supply, a significantly encouraging trend.

Available data indicates that total new supply averaged 9,829,000 b/d, or only 50,000 b/d above demand. Last year, the first half supply was 108,000 b/d above demand.

Refinery runs in the first half averaged 8,013,000 b/d, up 1.4%.

Total demand in June, averaging 8,770,000 b/d, was just barely ahead of last year. But supply averaged 806,000 b/d above demand. Last year, the June supply exceeded demand by 622,000 b/d.

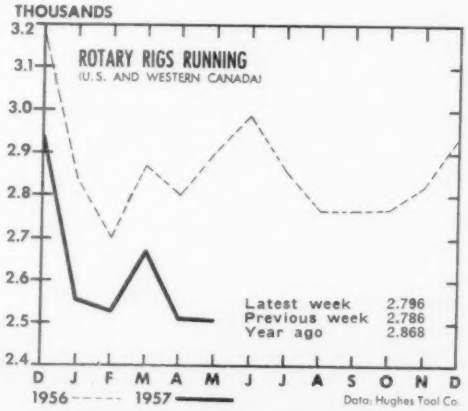


CRUDE STOCKS
Week-ended 6-22 273.2
Previous week 274.2
Year ago 275.6

GASOLINE
Latest week 188.5
Previous week 189.2
Year ago 181.4

DISTILLATES
Latest week 143.2
Previous week 138.3
Year ago 119.5

RESIDUAL
Latest week 44.7
Previous week 43.9
Year ago 38.4


THOUSANDS
ROTARY RIGS RUNNING
(U.S. AND WESTERN CANADA)
Latest week 2.796
Previous week 2.786
Year ago 2.868
D J F M A M J J A S O N D
1956 ----- 1957 ——
Data: Hughes Tool Co.

The Market Trend

Wages and Prices and Sellers and Facts

The price-wage product advances for the past several weeks will have a tough time sticking. The tricky thing about prices is that sometimes the most easily justified price—such as $2.75 for bunker oil at the Gulf—may be high enough to price you out of the market. After all, the real price for oil—though maybe not the "right" price—is what you can get for it.

The trouble with cost-plus ideas on pricing is the continued growth of the nation's refining capacity. Over the past year, U. S. refineries beefed up capacity by 450,000 b/d (5.3%), to 8.9-million b/d. Capacity, then, is moving up faster than demand. And excess-capacity markets by their very nature are thin-margin markets.

Gasoline probably has the best chance of any product of holding its 0.2¢ increases. But not necessarily because of higher costs. Refinery strikes in the Upper Midwest have drawn off excess supplies from the Chicago market. River gasoline has tightened for the same reason. Discounting of gasoline has eased along the Great Lakes Pipe Line. At the Gulf, motor fuel has strengthened about 0.75¢—which is another way of saying that the 1¢ discounts of a month ago have been cut to 0.25¢ discounts today.

But many of the advances in light fuel oils merely mean that suppliers will give larger allowances. There is extensive shading in distillates at Chicago, and traders freely predict a breakthrough below 10¢ for No. 2 fuel. No. 2 can also be shaded by at least 0.25¢ at the Gulf. Spot cargoes of heating oils, at USMC—20% ocean rates, can lay down at New York well below contract-delivery prices—never a good sign.

Price fires will break out in heavy fuel markets, too. This week a Chicago wholesaler chartered out his river barges for 60 days rather than pay what he thought were "high" prices at the Gulf. East Coast sellers—for reasons of price—see an increasing slice of their utility sales slipping away to gas. Said, one large marketer at New York: "Judged on tanker rates alone, heavy fuel prices should be moving down, not up."

Kuwait To USNH:

A coal-state senator probably couldn't envenom the imports question as much as low tanker rates are doing right now. Last week, a T2 was fixed for a Kuwait-Philadelphia voyage in July as USMC—50%, payable in sterling.

This means that 31-gravity Middle East crude can land on the U. S. East Coast at $2.86 a bbl., based on $1.85 posted in Kuwait. This landed price, as everybody in the Southwest knows, is only 2¢ higher than the wellhead price of West Texas sour of comparable gravity.

Quarrels Over No. 6:

Quite a few New York marketers of No. 6 fuel are hopping mad this week. When their suppliers advanced bunker "C" fuel prices to $3.15 barges, they also advanced their delivered-contract cargo prices 5¢.

The upshot is that delivered-cargo buyers find themselves at a further disadvantage to f.o.b. fuel oil buyers in the Caribbean (where prices were unchanged). The cost to a delivered-price buyer is about $3.00 a bbl. But the f.o.b. Caribbean buyer can lay in oil at about $2.75.

Caribbean and U.S. sellers were fighting over a German inquiry for two cargoes of bunker oil this week. But Caribbean sellers look a cinch to win.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices of July 1

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....13.5-14.375
- Gasoline, 92 oct reg....11.5-12.625
- Kerosine....9.625-11
- Heating oil, No. 2....9.5-10.5
- Gas oil, 48-52 d.i....9.75-10.625
- Fuel oil, bunker "C"....$2.75-3.15

Caribbean, cargoes
- Avgas, Grade 100/130....17.5
- Gasoline, 93 oct research prem....11.75
- Gasoline, 87 oct research reg....10.875
- Gasoline, 79 oct research....10.125
- Gasoline, 70-72 oct motor method....9.75
- Kerosine....9.625
- Heating oil, No. 2....9.5
- Gas oil, 48-52 d.i....9.75
- Fuel oil, bunker "C"....$2.55

New York Harbor, barges
- **Kerosine....11.5†-12.45†**
- Heating oil, No. 2....10.85-11.85
- Fuel oil, No. 6....$3.10-3.15

Okla-Group 3, northern, shpt, bulk
- **Gasoline, 89 oct reg....11.75†-12.5**
- Kerosine....10.125-10.875
- Heating oil, No. 2....9.125-10.25
- **Fuel oil, No. 6....$2.15↓-2.45**

Chicago, bulk
- **Gasoline, 91 oct reg....13-13.8†**
- Heating oil, No. 2....10-10.65
- Fuel oil, No. 6 high sulfur....8.6-8.7

Los Angeles, rack
- Gasoline, 84 oct reg....13.6
- Diesel fuel, PS 200....10-11.25
- Light fuel, PS 300....$3.40-3.65
- Heavy fuel, PS 400....$2.85-3.05

Natural Gasoline, Grade 26-70
- FOB Group 3....4
- FOB Breckenridge, Tex....3.5

LP-Gas
- Propane, Oklahoma (Group 3)....3.5-5

Penna Lubes
- Bright stock, 25 p. t....27
- 200 vis. neutral, 25 p.t....25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....25.5-26.5
- Neutral, solvent, 200-210 vis....21.25-22.25

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26.5
- Neutral, solvent, 200 vis....23

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130....18.875
- Gasoline, 79 oct research....10.75
- Kerosine....11
- Gas oil, 48 d.i. minimum....10.875

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9....3.07
- North Dakota, 36.0-36.9....3.07
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - **G. Coast, upper & lower, 26.0-26.9....3.07↓-3.22**
  - West Texas, sweet, 36.0-36.9....3.07
  - West Texas, N. M. inter., 36.0-36.9....3.00
  - West Texas, N. M., sour, 32.0-32.9....2.86
  - East Texas, flat....3.25
  - Mirando, 28.0-28.9....3.51
- Illinois Basin, flat....3.15
- Pennsylvania Grade, Bradford dist. flat....4.88
- California, Signal Hill, 21.0-21.9....2.93†
- North Louisiana-Arkansas, 36.0-36.9....3.20
- Wyoming sweet, 36.0-36.9....3.00
- Wyoming sour, 32.0-32.9....2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.)....2.72
- Leduc-Woodbend (Alta.)....2.78
- Redwater (Alta.)....2.67
- Daly (Man.)....2.52
- Smiley, Sask.)....2.44

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido....3.75
- San Joaquin, 40.0-40.9, Puerto la Cruz....3.37
- Oficina, 35.0-35.9, Puerto la Cruz....3.05
- Tia Juana, Medium, 26.0-26.9, Amuay....2.55
- Bachaquero, flat, Amuay, Las Piedras....2.23
- Tarra, 38.0-38.9, San Lorenzo....3.08
- Lagunillas Heavy, flat, Amuay....2.38
- Cardon....2.20

†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....2.08
- Safaniya, 27.0-27.9, Ras Tanura....1.79
- Iran, 34.0-34.9, Bandar Mashur....1.91-2.04
- Iran, 34.0-34.9, Abadan....1.86-1.99
- Iraq, 35.0-35.9, Fao....1.98
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.85
- Qatar, 41.0-41.9, Umm Said....2.20-2.23

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon....2.69
- Iraq, 36.0-36.9, Tripoli, Banias....2.69

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, 37-38....2.75

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-N. Y., clean....(USMC —20%) $2.28
- U.S. Gulf-N. Y., dirty....(USMC —27½%) $2.97
- NWI-USNH, dirty....(USMC —45%) $1.49
- NWI-UK/Cont., dirty....(Scale —10%) 29/3*
- **P. Gulf-UK/Cont., dirty..(Scale —17½%) 45/9*↓**
- **Pers. Gulf-USNH, dirty....(USMC —50%) $6.35↓**

**Sterling*

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611 South Boston
Gibson 7-5594

England, London E. C. 4 Herbert Lagler
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95 Farrington St.

DEPT/Service & Equipment Companies

ALEX F. FINO has been appointed chief engineer of Hammond Iron Works, in Warren, Pa. Fino, well known in petrochemical and technical circles, has been associated with Hammond since 1940. He has had principal responsibility for the design and development of various Hammond patented products, including Tubeseal Floating Roof, Dialift, Diafloat, and other oil conservation devices.

A. F. Fino

M. C. Cornish

M. C. CORNISH is the newly elected secretary-treasurer of Mid-Continent Supply Co. Ft. Worth. He has been with the company since 1945, when he joined it as chief accountant.

BILLY CRICE will be in charge of the new district operating office opened in Kilgore, Tex. by Welex Jet Services, Inc. He was formerly assistant manager and sales engineer in the company's Beaumont (Tex.) district for three years. The new store is another step in the company's expansion program to provide jet perforating radioactivity well logging and other associated wireline services to all major oil fields.

JOHN ROBACK and **C. R. LAMBERT** have been named managers of engineering and operations, respectively, of Fischer & Porter Co., manufacturer of process instrumentation. **Norbert Weber** becomes assistant sales manager of the data reduction and automatic division. Prior to the promotions, Roback was chief project engineer and Weber was manager of the international division. Lambert had been administrative engineer for Daystrom, Inc., before joining F & P. All three men will be located at company headquarters in Hatboro, Pa.

JOSEPH KAPP is the new sales representative in Chicago of the Davison Chemical Co. Division of W. R. Grace & Co. He is replacing **W. A. Skibbe, Jr.**, in the petroleum catalyst department. Skibbe is transferring to Baltimore headquarters of the firm. **Edward J. Bieberich**, production plant supervisor, has been named superintendent of Davison's desiccant manufacturing plant at Gallup, N. M.

R. C. POWERS and **D. N. HARROLD** have organized D & R Well Service, Inc., in Edmond, Okla.

JAMES E. HARRELL, JR., wil represent the products department of Universal Oil Products Co. in technical sales work in the Gulf Coast area. Prior to joining UOP, he was superintendent of Suntide Refining Co.'s Corpus Christi plant.

RALPH T. ENLOE will represent Bovaird Supply Co. at the company's newly opened Shreveport (La.) office. He was formerly a sales and service man for Emsco Mfg. Co. in Shreveport. The new office will serve the Ark-La-Tex areas.

ROBERT M. BRINEY is the newly appointed president of Haynes Stellite Co., division of Union Carbide Corp., New York. Since 1950 he has been vice-president of wrought alloy products for the division, with offices in Kokomo, Ind., and, more recently, New York.

WILLIAM F. PHILLIPS will head the newly formed alkali sales division of Jefferson Chemical Co., New York. He was formerly associated with American Cyanamid Co. Jefferson produces essential chemicals from hydrocarbon sources.

ROBERT J. BAUMANN has joined Beckman Instruments, Inc., as director of marketing for the scientific instruments division, Fullerton, Calif. For the past two years, he had been manager of industrial marketing for the O-Cel-o Division of General Mills, Inc., Buffalo, N. Y.

LLOYD C. GARRIES will manage the Saskatchewan area for Core Well Ltd., Canada, from headquarters in Weyburn. The company deals in sales of diamond boring barrels, heads, and bits; and in field and magnet services.

ALDEN F. PIXLEY has been named applied science representative in the petroleum department of International Business Machines Corp.'s western region, San Francisco. Since 1955, he has held a similar position in IBM's Richmond (Calif.) sales office.

T. T. Arden

J. A. Robertshaw

THOMAS T. ARDEN has been elected president and **JOHN A. ROBERTSHAW**, board chairman of Robertshaw-Fulton Controls Co., New York. Since 1947, Robertshaw has been president, and Arden executive vice-president of the company. A three-man executive committee has been formed headed by **Richard S. Reynolds, Jr.**, former board chairman. It includes Robertshaw and Arden. The firm manufactures thermostats and precision devices for automatic control of temperatures and pressures.

J. Hilder

J. McPeak

C. Bloss

R. Klingler

T. Ulug

B. Alderdice

IDECO, one of the Dresser Industries, has enlarged its Dallas headquarters staff with six personnel changes. **Jack Hilder** is the new assistant to the vice-president. He will manage production of Full-view masts and slush pumps. **Johnny McPeak,** assistant manager of the Full-view mast department, will have primary responsibilities in production control of masts and substructures. **Ray Klingler** is transferring from Ideco's technical service department in Mexico City to Dallas to assist in the production and inspection of masts. **Clyde Bloss,** formerly service representative, becomes assistant to the central service manager. **Turgut Ulug,** technical service engineer, moves from Houston to assist both the vice-president, in domestic sales, and Hilder, with the Ideco pump program. **Bob Alderdice** has joined Ideco as assistant to the advertising manager. He was formerly with the advertising department of General Electric Co., Schenectady, N. Y.

H. E. WAGNER has been appointed consultant and sales representative of Bradford Supply Co., Bradford, Pa. He was formerly eastern district manager of Jones & Laughlin Supply Division. He will continue to make his headquarters in Pittsburgh, covering areas in Ohio, West Virginia, and Pennsylvania.

ROBERT J. ALLEN has joined Tracerlab, Inc., of Waltham, Mass., as assistant advertising manager. He has been in the U. S. Navy for the past 3½ years as communications officer on a tactical command ship. **Joseph P. Beyer** and **Charles B. Mead** are new sales representatives in Los Angeles and Detroit, respectively, for the company. Tracerlab manufactures radioactive chemicals used in oil exploration, radiation logging equipment used in oil exploration, and instruments for using radioactive chemicals in the oil process industries.

M. P. YOUKER has been named assistant manager of the western export department of Oronite Chemical Co., San Francisco. He was head of the company's technical service for the past ten years. In the new position, Youker will be concerned with marketing company products in Central and South America, Mexico, and the Far East.

RHEEM MFG. CO. is building a steel container manufacturing plant in Tacoma, Wash. Production of drums for petroleum, chemical, and other industrial processors and customers in the Pacific Northwest is scheduled to start in the Fall.

WILLIAM P. QUAN has been elected vice-president in charge of finance for Franklin Supply Co., Tulsa. Quan, formerly comptroller and secretary, has been a director since last year. **Leland H. Strouse** is transferring from Denver to Calgary, as vice-president of Franklin Pipe & Supply, Ltd., a Canadian subsidiary. He continues as a director, but will relinquish his former position as vice-president of Franklin Supply. **Clarence Sublett** will go to Chicago as manager of the export division. With the company since 1945, he opened Franklin's first Canadian store at Edmonton in 1952 and has served as vice-president of Franklin Pipe.

C. L. NELSON will manage the newly opened service store in Farmington, N. M., for MWL Tool & Supply Co. **A. J. Boyd** is the store's service operator. In the Farmington area, MWL is distributor for Brown Oil Tools, Inc., Grant Oil Tool Co., and MacClatchie Mfg. Co.

HOMER S. MYERS has been named to the newly created post of vice-president of marketing for Tracerlab, Inc., Waltham, Mass. Myers, a founder of the firm, was formerly general manager of its industrial division.

T. E. AUSTIN has been promoted from sales engineer in Oklahoma City, to manager of the Medicine Lodge (Kan.) branch of McCullough Tool Co. Two newly appointed sales engineers are **Bruce January,** moving from Houston to El Campo, Tex.; and **D. B. Petty,** from Hominy to Wewoka, Okla.

BRUCE HELLER, sales representative of Enardo Mfg. Co., Tulsa, is transferring from Carmi, Ill. to Regina, Sask. The company, manufacturer of valves, fittings, and other oilfield specialty equipment, has a sales office and warehouse in Edmonton, and plans to open other Canadian branches soon.

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There Is No Magic Formula

EVERYONE HAS TO PUT his shoulder to the wheel if the import problem is to be solved. It can't be done by one state or by a single company. Not even the federal government can do it, unless those high in the Administration make up their minds which direction they are going and then take decisive action.

Despite the appointment of a new cabinet committee, there's still as much indecision in Washington over the imports question as there was at the time the so-called defense amendment was incorporated into the Reciprocal Trade Agreements Act in 1955. This act authorized the President to impose restrictions when imports threaten national security.

In February of that year the President's Cabinet Fuels Policy Committee had recommended that foreign oil was not to exceed the share of the U.S. market it held in 1954. Crude imports then averaged 651,000 b/d, or 10.3% of domestic production. They've been on the rise, except during the Suez crisis, ever since, and now are 15.1% of domestic production.

It's true that the Office of Defense Mobilization has made various proposals for voluntary action in an effort to pull imports back to the proper level. But they were all so riddled with exceptions and exemptions that they were meaningless. Then, too, only a handful of companies ever complied.

THIS SHOULD BE sufficient evidence that voluntary action will not work in a competitive economy. Where one company or even a few companies might be willing to cooperate on a voluntary basis, another may be reluctant because one-half of its refinery runs are geared to imports, and still others might be planning to operate solely on imported crude.

And while such companies are filling the appetites of their product demand with the less costly foreign oil, the domestic industry is suffering. No better evidence to support this is needed than the sharp cut made in the Texas allowable for July, when producing days were reduced to 13, lowest in the state's history. Not only will such a low producing rate further stifle already curtailed drilling, at a a time when exploration should be increased, but it also bites deeply into a state's revenue. In the case of Texas, the cost in tax revenue is estimated at $50-million annually.

IT'S NO WONDER that the domestic producer and the oil producing states are tired of the dilly-dallying in Washington, and are pushing for concrete action. But whatever the imports control plan—whether tariff or quota—it must be a workable one, acceptable to all the diverse industry groups.

There is no magic formula. But a solution is possible if all of the industry and the federal government really want it.

Congrats and $25 to Mrs. JEWEL SUMMERSILL, Humble Oil & Refining Co., Baytown, Texas, for this quip.

"...rigger mortis..."

There's no sleeping at Lone Star Steel. Lone Star's big plant is almost as bright at night as in the sunlight! Our friend Joe Roughneck needs pipe... fine API casing, tubing and line pipe... and we are delivering on the double!

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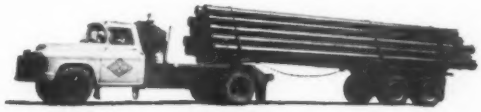

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